FISHERIES RESOURCE CONSERVATION COUNCIL

2003 / 2004 Conservation Requirements for Groundfish Stocks in the Gulf of St. Lawrence

Report to the Minister of Fisheries and Oceans

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LETTER TO THE MINISTER

April 11, 2003

The Honourable Robert G. Thibault, P.C., M.P.
Minister of Fisheries and Oceans
200 Kent Street
Ottawa, ON K1A 0E6

Dear Minister,

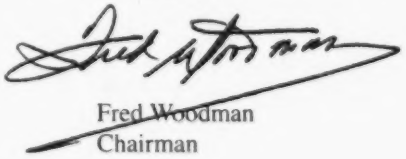
Following on our earlier advice on cod stocks, the FRCC is today providing you with a complete set of recommendations on the Gulf of St. Lawrence groundfish stocks in NAFO subdivisions 4TVn and 3Pn4RS. The Council has carefully evaluated the scientific data and consulted fishermen and industry members toward providing the following set of recommendations that are aimed at setting the stage for a more comprehensive approach in the long-term rebuilding of the resource.

The Council emphasizes the need to consider the interdependence of its recommendations. The Council has noted in this review and during the consultations leading to the Fisheries Resource Conservation Plans that a rebuilding strategy is unlikely to succeed unless all factors affecting the resource are addressed in concert. Taken in isolation, one from the other, the desired improvements in stock status results may not be achieved. What is presented here is a suite of measures that represents what the Council feels is the best chance for rebuilding the groundfish stocks in the Gulf.

The enhanced protection of spawning areas, reduction of predation by seals through the enforcement of specific seal exclusion zones, and improved capacity management through the use of conservationist gear are the key contributing recommendations that underlined in this report. In its analysis, the Council understands that even a complete fishing closure does not guarantee that stock rebuilding will occur, and rather would more likely result in a total abandonment of the resource as has occurred in the case of 4VsW cod. In calling for a significant reduction in total removals this year, the Council affirms that the continued engagement of a responsible, reduced, and controlled fishing sector is an essential part of the long-term rebuilding process for groundfish stocks in the Gulf of St. Lawrence.

We trust the following advice will be of guidance and that the spirit of the recommended approach prevails during the elaboration of final measures for long-term rebuilding of these stocks.

Yours truly,



Fred Woodman
Chairman

INTRODUCTION

This is the fifth FRCC report dedicated to groundfish stocks in the Gulf of St. Lawrence. Unlike past reports, in this report the FRCC – and the Minister – have had to deal with new conditions surrounding pending decisions for fishing groundfish in the northern and southern Gulf management areas in 2003/2004. These conditions are related primarily to the recommendations for the northern and southern Gulf cod stocks in the 3Pn4RS and 4TVn management areas.

Firstly, in its previous report on the Gulf cod stocks, the FRCC concluded that if stock abundance levels in this current year showed significant decline, then the total removals for the fisheries must be significantly reduced.

Secondly, the Minister had instructed the Council that in order to justify any type of ongoing harvesting on these stocks, the Council must now evaluate the prospects for an immediate, substantial and durable improvement in stock condition.

Thirdly, following the National Workshop on Reference Points for Gadoids held in November 2002, limit reference points were estimated for the Gulf cod stocks. These limit reference points were defined by scientists as conservation limits such that if estimated spawning stock biomass levels approached these limits then "rebuilding the spawning biomass will be a primary consideration for management. Harvesting the stock under such circumstances would be considered harm to the resource."

In response to these directions to making its recommendations, the FRCC notes that the scientific information this year continues to be pessimistic. Indeed, despite the differing views presented by industry on stock status again this year, the FRCC does not deny that the Gulf cod stocks have not improved since the end of the moratoria at the end of the 1990s, and there is little sign – from continued evidence of low numbers of recruiting fish – that the prospects for an immediate improvement in stock condition is probable. Finally, in absolute terms, the cod stocks are both undeniably at or below their respective estimated limit reference points.

In considering the evidence, and in response to the Minister, the fishing industry and communities consulted, the FRCC reviewed the range of strategies that have been proposed. These strategies include harvest policies for Gulf cod stocks ranging from "status quo" to complete closure of the directed commercial fishery.

The Council is unequivocal in stating that for both cod stocks, the urgency of the situation this year means that the "status quo" is no longer appropriate. In its analysis of a complete closure of the Gulf cod stocks, the Council concludes that this too is an unrealistic option that would in no way guarantee stock rebuilding. The difficulty the Council has with such a draconian approach is that, taken on its own, it does nothing to assure prospects for an immediate, substantial and durable improvement in stock condition. Moreover, there is a view that a closed fishery – and an alienated fishing sector - would actually result in an increase in unreported mortality. The Council judges this to be a real threat that could inflict continued undetected harm to the resource.

In rejecting the wholesale closure option, the Council acknowledges that only in partnership with fishermen – who must take responsibility themselves for stewardship of the resource – can these stocks be stimulated to grow and rebuild. Indeed, the preamble to the Council's Fisheries Resource Conservation Plans (FRCPs) for the Gulf cod stocks notes that success of long-term planning depends on the Department of Fisheries and Oceans ability to deal with the elevated rate of natural mortality attributed to the seal herds, and on the development of a renewed relationship between the fishing industry in the Gulf and the decision-making process. This renewed relationship, under the principles of shared stewardship espoused by the Atlantic Fisheries Policy Review and operationalized in the Code of Conduct for Responsible Fisheries, needs to be based on real shared responsibility between government, industry and other stakeholders in the Gulf, and a partnership in decision-making that involves open and timely discussion and debate on decision alternatives, together with the responsibility to carry these out.

The Council judges that simply taking groundfish fishermen off the Gulf waters at this time will not stimulate stock rebuilding but will destroy the move to real partnerships. Furthermore, extended closures as applied elsewhere in Atlantic Canada have not been successful on their own, e.g., the 4VsW cod fishery along the eastern Scotian Shelf has been under a moratorium since 1993 and scientists estimate now that this stock is only of fraction of the size it was 10 years ago.

The declaration by science for the Gulf cod stocks that biomass will not improve appreciably or continue to decline even with a complete fishing closure is there-

fore interpreted by the Council as an overwhelming need to take auxiliary action independent of fishing. The Council furthermore believes that this action can only be accomplished together with a compliant, responsible, and reduced fishing industry working in partnership with the Department toward stock rebuilding.

The Minister has heard this same call for action before from the FRCC. Until steps have been taken, the FRCC is obligated to continue the thrust by calling for concerted, integrated action on the following fronts:

1) **Establish seal exclusion zones to reduce the seal herds in areas where spawning and juvenile fish can be protected.**

2) **Extend the protection of cod spawning areas and times.**

3) **Apply conservationist fisheries harvesting approaches.**

The wait for action on seals has long passed. Unless and until something is done with regard to these predators, the cod population will not rebuild to levels that could support a commercial fishery. Protecting cod spawning activity from all forms of fishing mortality has long been a tenet of the FRCC and will continue to be so despite the inherent difficulties associated with full implementation of spawning closures. In this report the FRCC recommends changes to fish harvesting practices separately in the northern and southern Gulf that include feasible, conservationist proposals to change immediately and radically the manner in which fisheries are operated and fish are currently captured in these areas. The industry has promoted these changes as conservation measures to reduce waste in the fishery. The FRCC encourages the Minister to consider these changes as an integral part of the overall strategy to introduce immediate positive effects toward stock rebuilding.

Although these general recommendations may sound familiar, this report cannot be construed as a rehash of past FRCC reports. In this report the Council proposes specific, sweeping measures specifically on the three items listed above. These measures will impact the industry, fishing communities, DFO Managers, and DFO fisheries scientists. However, the Council, in discussions with industry is keenly aware that they are willing to endure further hardships and make real change in an effort to improve the current stock situation. **In making its stock specific recommendations below to maintain a small index fisheries on Gulf groundfish, the Council acknowledges the will of industry to change and encourages the Minister to take advantage of this opportunity to maintain a working relationship with a smaller, manageable and responsible industry working toward stock rebuilding in the future.**

The Council believes that a coordinated set of actions on the issues outlined above present the best chance to meet its own mandate for stock rebuilding, to comply with the Minister's request for an immediate, substantial and durable improvement in stock condition, and to move the stocks out of the fixed range at or below the limit reference levels defined by science.

The following sections describe in further detail the Council's general recommendations to the Minister relative to the whole of the Gulf of St. Lawrence. Detailed recommendations specific to each stock are provided in the stock-by-stock analyses.

1) Seals

The FRCC is convinced that predation by seals is preventing the recovery of the two major cod stocks in the northern and southern Gulf. Recent scientific information supports this statement. In the peer reviewed assessment process that focused this year on selected Atlantic cod stocks, including the Gulf cod stocks, international scientists examined reasons for the lack of recovery of cod stocks. They state unequivocally that "natural mortality of adult cod remains high". Furthermore, they also declare that "seal predation is a major factor contributing to this elevated mortality."

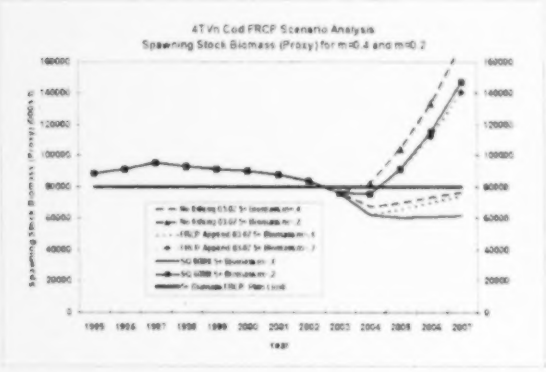
Finally, a recent paper by Gulf scientists makes a link between the grey seal population size in the southern Gulf and the natural rate of mortality of adult cod.

Following the Minister's request to develop and implement a long-term management plan for cod and a rebuilding strategy for Gulf groundfish stocks, the FRCC has been engaging in discussions for the Gulf cod stocks with industry and DFO scientists and fisheries managers. The Council's Fisheries Resource Conservation Plans (FRCPs) for 4TVn Cod and 3Pn4RS Cod have now been drafted as the basis for long-term planning in these stocks.

As noted above, the preamble to the FRCPs states that success of such Plans depends on our ability to deal immediately with the elevated rate of natural mortality attributed to the seal herds, and on the development of a real partnership between industry and DFO whereby industry can assume responsible in keeping with their active participation in the fishery.

In the projection analysis of strategic alternatives presented in the cod stock FRCPs, and under current estimates for growth and recruitment, the evidence clearly shows the effect on stock growth of reduced natural mortality levels (such as those normally experienced in the history of the cod stocks and, as assumed by science for years prior to 1986 in recent stock assessment analyses). As noted in the figure below for the case of 4TVn cod in the southern Gulf, for a range of annual fishing levels between "status quo" (6,000t per year) and no fishing, the immediate return to the lower natural mortality of M=0.2 (from 0.4) for 2003 through 2007 gives the projection that the stock will rebuild fully – independent of the fishing strategy - within five years assuming the same levels of reduced recruitment and growth as estimated in recent years.

This graphic also clearly shows that independent of the fishing strategy and even with zero fishing, the stocks (3Pn4RS similar to 4TVn illustrated here) are expected to remain in the zone below their respective estimated limit reference point for this stock at current rates of growth and recruitment. Thus, the benefits of a closed fishing strategy to stock rebuilding are nullified as long as the elevated rate of natural mortality persists.



**See annex for larger graph*

Given the Minister's request to the FRCC to evaluate the prospects for an immediate, substantial and durable improvement in stock condition, the *only* credible response by the FRCC to this request is to seek from the Minister – once again – immediate, substantial and durable action to reduce natural mortality on all cod stocks by reducing the predation by seals. The only means of achieving this to reduce the seal herd size.

The FRCC notes the Minister's reference in the 2003-2005 Seal Management Plan, to have the department "evaluate the feasibility and value of establishing seal exclusion zones to protect aggregations of spawning cod stocks". In order to accomplish this the FRCC defines specific proposed seal exclusion zones as pilots for immediate establishment together with the participation of local communities, and DFO Fisheries Managers and Marine Mammal scientists for key locations in the Gulf. Details on specific areas are included in each of the 3Pn4RS and the 4TVn cod stock recommendations.

The FRCC recommends, as a priority for stock rebuilding, that the Minister act immediately to establish year-round seal exclusion zones in specific areas in 4T and 4Pn4RS.

2) Spawning protection

The Council considers that fishing on spawning concentrations disrupts spawning activity and reduces the viability of the eggs. While the Council is reluctant to recommend a complete cessation of all fishing to protect spawning concentrations of cod for the disruption it would cause, it still is concerned that current limitations on catches during spawning times and locations are insufficient limits to fishing to protect the spawning concentrations.

Given the gravity of the continuing recruitment problems, the Council recommends a complete cessation of all directed cod fishing throughout the Gulf of St. Lawrence (North and South) be extended to the period from April 1 to June 23.

3) Capelin

Given the recent apparent increase in capelin in 4T, uncertainty about the population of capelin in 3Pn4RS, and noting the importance of the capelin stocks to the potential growth and rebuilding of the cod stocks, the FRCC encourages the development of an integrated capelin-cod science program within DFO Science in order to develop and present scientific information on the joint ecosystem dynamics of these linked species.

As noted above, the FRCC has been engaging in discussions on the Gulf cod stocks with industry and DFO scientists and fisheries managers on long-term planning. In the Council's Fisheries Resource Conservation Plans (FRCPs) for 3Pn4RS Cod the preamble states that success of the Plans is contingent on our ability to protect the capelin stocks through a more informed study of capelin abundance estimates and trends, and linked cod and capelin interactions.

The following recommendation is made toward facilitating the regular production of information on ongoing observations about the cod-capelin dynamics throughout the Gulf area.

The FRCC recommends that DFO Science establish a Joint Working Group of cod and capelin scientists with expertise on the Gulf of St. Lawrence to report to the Gulf groundfish RAPs in 2003 on information pertaining to: (i) capelin stock abundance, (ii) capelin stock dynamics, and (iii) cod stock behaviour relative to capelin stocks in the area.

4) Recreational fishing

For groundfish resources in a precarious state, the FRCC reiterates its stand on recreational fisheries in Atlantic Canada. This position, based on the Council's 1997 Conservation Framework, supports only those fisheries that are controllable to the greatest extent possible and return the maximum information to science and management. At this time, the FRCC, does not believe that information forthcoming from the 2001 and 2002 pilot recreational fisheries in the northern Gulf as well as the more traditional southern Gulf recreational fishery will be of equivalent quality compared to that from the sentinel and commercial fisheries collected by professional fishermen who operate under a management regime of strict controls and monitoring. On these grounds the FRCC reiterates the following recommendation.

The FRCC does not support the operation of a recreational fishery throughout the Gulf of St. Lawrence groundfish fisheries (NAFO subdivisions 3Pn4RS and 4TVn) at the present time and recommends that no recreational fishery take place in 2003/2004. Until such time as resources can be applied to control this fishery and a more complete compliance of the mandatory reporting of logbooks is attained, then the recreational fisheries should not be allowed to continue.

5) Sentinel programs

The FRCC reaffirms its support for the objectives of the sentinel program throughout the Gulf of St. Lawrence and supports all efforts of this cooperative industry-science program to increase information gathering and stock research opportunities. **In particular, the FRCC supports sentinel activities that lead directly to information that will assist scientists to enhance the reliability and confidence of stock abundance estimates.**

6) Oil and Gas Exploitation

As in the past, the FRCC still believes that any activity that would have a negative impact on fish productivity must be closely assessed and monitored.

During consultations, a few stakeholders raised concerns about the apparent activities of the oil and gas companies, and stressed the importance of a full evaluation of the resources which could be adversely affected.

The FRCC continues to recommend that no decisions on oil and gas exploration and development activities should be taken before all information, from DFO and from CNOPB and CNSOPB, is made available publicly.

These non-stock specific recommendations are presented to the Minister as an integrated set of actions. The Council feels strongly that if they can be acted on immediately in a coordinated directed approach, in partnership with industry and fishing communities, then they represent the stocks' best opportunity to return to a productive state in the short run.

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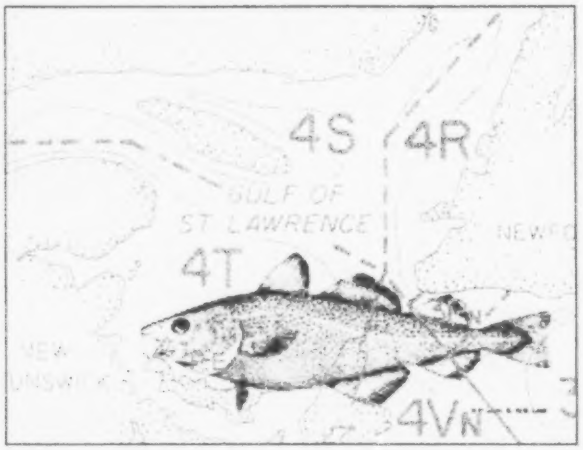
Stock-by-Stock Recommendations

COD - 3PN4RS



PERSPECTIVE

The stock is located north of the Laurentian Channel, west of Newfoundland and on the lower north shore of the Gulf of St. Lawrence. The stock overwinters outside the Gulf, southwest of Newfoundland in deep water. In the spring, the fish move toward the Port au Port Peninsula near Bay St. George on the west coast of Newfoundland where spawning begins. During the summer, the cod disperse toward inshore areas along the west coast of Newfoundland and the Middle and Lower North Shore of Quebec. The inshore migration is influenced by warmer waters and the presence of capelin, the primary prey of cod. This stock mixes with neighbouring stocks of Northern cod, Southern Gulf cod, and the southeastern Newfoundland cod stock in area 3Ps.

This cod stock was the more productive of the two Gulf cod stocks, with catches in a mixed fixed gear and mobile gear fishery regularly above 50,000t until the late eighties, and some years above 100,000t.

Prior to 1994, this stock experienced the effects of poor fishing practices (harvesting of undersized fish, dumping, highgrading, misreporting, etc.). Overfishing combined with poor environmental conditions may explain the sharp decline observed in the early nineties, which led to the closure of the fishery in 1994. The fishery reopened in 1997 at low levels prosecuted by fixed gear vessels only.

ANALYSIS

I. SCIENCE STOCK ASSESSMENT

The 2003 Stock Status Report (SSR) for 3Pn4RS cod reports that abundance and SSB estimates remain low. The slow rebuilding following the 1994-1996 moratorium saw stock increases between 1994 and 1999. After the moratorium, this rebuilding peaked in 1999 and has declined slowly since. This trend is a consequence primarily of the trawl abundance indices (research vessel and two mobile sentinel surveys) that increased from 1995 to 2000 but have declined at similar rates since. However, scientists also report that a portion of the stock in shallow water may be becoming less available to the research vessel and sentinel trawl surveys but is being monitored by sentinel longlines. Other highlights from the 2003 SSR include:

- Production – stock assessment estimates report a reduction of SSB over the previous year and recruitment at age 3 cod estimates declining since 1998 to reach historic low levels in the latest 2003 estimate of age 3 cod.
- Environment – energetic condition and growth have improved in recent years, fish now mature at older ages, weights at age have increased from 1990 to 1998 and varied after without trend, biological characteristics appear positive; cod are increasingly concentrated throughout inshore in 4R and are more available to inshore fisheries.
- Fishing mortality – estimates are high since 1999; unaccounted mortality also suspected from underreporting in the recreational fishery and high discard rates from the gillnet fisheries in 4R.
- Natural mortality – remains high for adult cod attributed to seal predation as the major factor in this elevated mortality.

The scientific prognosis for the stock estimates that with no fishing in 2003/2004, the stock status is expected to increase marginally and is expected to remain stable at low fishing levels of 1,500t. For status quo catches in 2003/2004 of 7,000t (in effect since 2000), the SSB is projected to decline by 12%. The SSB estimated for 2003 is below the conservation limit reference points leading to high likelihood that the productivity of this stock has suffered serious harm.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000/01	2001/02	2002/03*
TAC	100	92.1	80.3	73.9	76.5	58	35	35	18	No directed fishery			6	3	7.5	7	7	7
Catch	87.3	82	66.5	43.7	44.8	37.5	31.8	30.6	17.7	0.5	0.09	0.03	4.3	3.1	7.2	6.2	6.9	6.3

*Catch as of January 3/2003

1. Above figures include Reported Landings extracted from the Integrated Fisheries Management Plan Atlantic Groundfish (IFMP)

II. Industry Views

The FRCC conducted public consultations on this stock in Cow Head and Port aux Basques, Newfoundland, as well as in the Magdelan Islands, Blanc Sablon, and Gaspé, Québec. In light of the recent reports in the media surrounding DFO's position on the future of the Atlantic cod fisheries, the tone of these meetings throughout the Northern Gulf was tense but constructive with good attendance and meeting participation. Participants came prepared to discuss a number of recurring issues summarized as follows:

1) Critical Analysis of the Stock Assessment. Again this year, industry participants questioned the stock abundance estimates for the stock in light of their observations of stock status from fishing. Formal presentations in both Newfoundland consultation meetings roundly criticized the analysis and results of the scientific stock assessment of the Northern Gulf cod following the 2002/2003 fishery. These presentations questioned again this year the effectiveness of the research vessel, *CCGS Alfred Needler*, to capture fish, as well as the design of the trawl surveys compared to where fish are actually caught by fishermen, i.e., as noted by science, in more inshore areas where the stock is not available to the trawls. Year-over-year differences were also noted in historical index trends and historical biomass estimates as an illustration of the degree of uncertainty in the estimates of stock size. Fishermen's observations of good catch rates over more widely distributed areas during the past three years of the same scale fishery (7,000t TAC, competitive cod CHPs since 2000) were not consistent with the more pessimistic declining view of the stock presented in the stock assessment.

2) Stock Mixing. At every consultation in the Northern Gulf, fishermen raised questions regarding the possibility that Northern Gulf cod could be mixing with cod in adjacent management areas and exploited under separate fishing plans where they may be subject to exploitation. This is an ongoing issue related to the hypothesis that the 3Pn4RS cod stock overwinters in areas in the adjacent 3Ps subdivision as far south as the Halibut Channel and could therefore be subject to harvesting by offshore gear in the fishery that takes place in 3Psh (the area around Halibut Channel). This issue remains an outstanding issue within science and is complicated by difficulties in coordinating research efforts on this question between the two separate regions of DFO implicated in the work.

3) Predation by Seals. Fishermen continue to note the major impact of predation by harp seals and some grey seals on this cod stock. They appear to be more resigned than ever to the negative impact of seals on stock rebuilding without recourse to being able to do anything about it. Some fishermen acknowledged the positive first steps of the increase recently announced in the harvest of harp seals, although at the same time, conceding that the proposed harvest increase is small relative to the population, and that the increase harvest of young seals will not have any immediate effect on the ongoing cod predation by adult seals. Fishermen cited numerous cases of seals staying year-round in areas they would normally leave by the spring, identified areas of large aggregations of seals ("hundreds of seals"), and reports of "belly-feeding" on adult cod and flatfish, and fish carcasses on ice.

4) Capelin Availability as Foodstock for Cod. Some fishermen, especially in inshore areas, pointed to an apparent lack of capelin in areas where cod might normally be found, and raised concerns about the importance of capelin as a foodstock for cod. Others reported that capelin, while available in the offshore areas of the Northern Gulf in good abundance, were experiencing changes in behaviour, e.g., spawning in deep water as opposed to on the beaches.

5) Unaccounted Mortality from the Recreational Fishery. Again this year, industry participants at consultations unanimously supported the recommendation for a halt to the recreational fishery pilot program since it continues to be judged to be an uncontrollable and unknowable source of mortality on the cod stock. Industry participants remarked that the "official data" of removals cited in the SSR for 2001 (revised from the science estimate of 886t in 2002 to 253t) and 2002 (34t) provided further evidence that real mortality from this fishery is unknown and underestimated.

6) Sentinel Fishery Activities. In spite of the impending changes and downsizing of the sentinel program, fishermen were generally supportive of the continuation and participation of the sentinel program as a

means of continuing longitudinal stock database information as well as maintaining industry contact with the resource. Some participants at the consultations however remarked about the apparent 'closed shop' mentality of the sentinel program participants and called for a more open process where others could also become involved.

7) Gillnet-Longline Product Grading Study. Although only briefly referred to in the SSR, the science presentations at consultations in the Northern Gulf also included a comparative analysis of product grading by gillnet and longline fishermen. The evidence presented clearly showed that gillnet catches were significantly graded lower than longline catches which were consistently top grade product. The implication that gillnet caught fish carried an inherent waste product factor in comparison with longline caught fish also substantiated various reports of unreported mortality at sea from discards in the gillnet fishery.

8) Alternative Fishing Plan Proposal. At the consultations in Newfoundland, industry presented a proposal for a revised fishing plan. It is understood that this plan has already been presented to the Department for its consideration. The major elements of this plan include: (1) establishment of an exclusive 100% longline and handline fishery for directing on Northern Gulf cod; (2) directed cod fishery closure from April 1 to June 23 each year in the area off Bay St. George, Port au Port previously designated to protect spawning fish; and (3) a TAC of 7,000t.

9) Industry Message Delivery by the FRCC. Industry participants at consultations made the point again this year that the FRCC has not been effective at delivering their feedback to the Minister of Fisheries and Oceans. While they agreed the FRCC had supported industry positions in the past, they were frustrated that the scientific advice had in their view priority access to the Council, and that industry-relevant Council recommendations had not been acted upon by the Department.

III. FRCC Recommendations

The FRCC is mandated to construct its recommendations to the Minister by considering, as summarized above, (i) the scientific evidence from the Stock Status Report, and (ii) the views of the industry provided in the consultation meetings and through briefs presented to the Council. These recommendations are provided to the Minister toward the ultimate goal of rebuilding the stock to "optimum levels". **In this year of continued crisis and urgency related to constructive action and positive response in this stock, the FRCC has taken a critical view toward proposing a suite of practical conservation measures for immediate implementation by the Minister and his Department.**

The following recommendations presented here are of two types: (1) recommendations pertaining to conservation measures independent of any fishery on the stock, and (2) recommendations pertaining to fishing practices and regulations while fishing. The Council urges the Minister to consider these recommendations as an integrated set of interdependent conservation measures. The Council therefore encourages the Minister and his staff to consider the acceptance of all of these measures as a whole and to engage in their immediate and coordinated implementation in full partnership with industry as the Council's best feasible advice to give the stock all opportunities to grow and rebuild in the short term.

1. Fishery Independent Recommendations

The following suite of recommendations are viewed by the Council as required ongoing conservation practices peripheral to fishing.

Seals. Given the Minister's request to the FRCC to evaluate the prospects for an immediate, substantial and durable improvement in stock condition, the Council is unanimous in declaring its *only* credible response to this request is to seek from the Minister – once again – immediate, substantial and durable action to reduce natural mortality on all cod stocks by reducing the predation by seals. The only means of achieving this is to reduce the size of the seal herds in the management area.

As a first step, the FRCC proposes therefore that the Minister act immediately to establish specific seal exclusion zones for Northern Gulf cod within the 3Pn4RS management area. In order to protect spawning fish in the designed area off Bay St. George Port au Port, and, in recognition of this area as an area where aggregations of seals are known to be present, the FRCC sees the immediate opportunity of limiting natural mortality on vulnerable cod stock aggregations through the designation of this area as a pilot seal exclusion zone consistent with the 3-year Seal Management Plan recently announced. The FRCC underlines the need for an orderly operation of the exclusion zone through the training of professional seal exclusion zone monitors. All monitors, in partnership with DFO marine mammal scientists will require a training period and will be tasked with regular reporting on the incidence and activities of seals in the exclusion zone, with moving seals off the area, with taking samples desig-

nated for scientific study, and learn more about the dynamics of seals in general.

The FRCC recommends the establishment of a year-round seal exclusion zone in the Bay St. George Port au Port area including the previously designated spawning box for cod in this area. The FRCC further recommends that local community groups present proposals for training and acting as seal exclusion zone monitors to carry out the responsibilities associated with the assigned tasks. Finally, the FRCC recommends that the proposals be directed to assigned DFO Marine Mammal specialists responsible for coordinating the operations, responsibilities, and management of the seal exclusion zones program.

Stock Analysis Information The Council continues to be uncomfortable with the uncertainty surrounding the assessed stock size and the different industry views. The Council is of the opinion that the scientific view of stock status for this stock is incomplete and that the critical arguments brought forward have some merit toward arguing a revised and somewhat more optimistic picture of stock status. However, in spite of being unable to reconcile the continuing differences in views between the assessment and industry views, the Council is unanimous in its concern for the declining trend in stock status. Moreover, the Council cautions that this stock clearly remains in a more precarious position than last year - it is not rebuilding, and it requires more than ever serious measures for enhancing conservation practices and for stimulating stock growth.

In response to the gap between the science view and the industry view of the stock, the Council notes that quantitative data on a significant proportion of commercial fishery catch locations (longitude and latitude), catch rates, catches by depth by time period and gear are not readily available for analysis although much of this information is recorded in logbooks. The Council is of the view that reconciliation of apparent problems in recording logbook data is a priority, and that the preparation and presentation of these input data together with a year-by-year comparison with that of the key research vessel survey and sentinel surveys would be an effective means of understanding differences and criticisms of perceptions on the stock at the level of the base data. The Council also encourages scientists to calculate absolute biomass estimates from the commercial catch data to compare and reconcile these to similar survey estimates.

The FRCC recommends that DFO Science in collaboration with industry prepare for the next RAP on this stock data analyses of: (i) a representative sample of commercial catches and (ii) research vessel and sentinel surveys catches for comparison of catch locations (longitude and latitude), catch rates, catches by depth, by time period and gear in order to compare the raw data views of the dominant information sources for estimating stock status including absolute biomass estimates from all these indices.

2. Fishery Dependent Recommendations

The following suite of recommendations are viewed by the Council as required ongoing conservation practices related to the prosecution of directed fishing for cod in 3Pn4RS.

Stock Mixing The Council has learned that new studies are being proposed to examine the extent of the movement of fish out of the Northern Gulf area into the adjacent 3Ps subdivisions. The Council applauds these longer-term efforts and looks forward to an arrangement by which scientists from the two different stock areas (and DFO Laurentian and Newfoundland Regions) will agree – on the basis of firm evidence – to attribute catches to their respective stocks of cod. In the meantime, the Council shares the urgency of fishermen to take more direct action on the mixing issue in the immediate term as a conservation measure on the more precarious position of the Northern Gulf cod stock.

While these scientific studies on the mixing of 3Pn4RS Gulf cod with the neighbouring 3Ps cod stock are pending, the Council does not have complete information on the true extent of mixing of these stocks and the risks of potential overlapping exploitation on a significant proportion of the stock. Nevertheless, the Council, on the suggestion from industry and in light of the regional coordination difficulties within DFO Science, perceives that it must act in a precautionary manner until such time as new information is forthcoming.

The FRCC recommends that the winter fishery closure (November 15 to April 15) on the offshore portions of Burgeo Bank (3Psd) be continued and that this closure be extended in 2003/2004 to include the adjacent areas of St. Pierre Bank (3Pse and 3Psg) and remain in place until such time as research may resolve this issue; the FRCC also recommends that for 2003/2004, fishing during the period (November 15 to April 15) on the inshore area of Burgeo Bank (3Psa) be restricted to resident fishermen only.

Recreational Fishery Based on the principles defined in the Council's Conservation Framework, the FRCC supports only those fisheries that are controllable to the greatest extent possible and return the maximum information to science and management. Following on the information provided for recreational catches in 3Pn4RS in 2002/2003 compared to past estimates, the FRCC does not believe that information forthcoming from the pilot recreational fishery in Newfoundland and Labrador is of equivalent quality compared to that from the sentinel and commercial fisheries collected by professional fishermen who operate under a management regime of strict controls and monitoring. The following recommendation therefore reiterates the Council's stand on recreational fisheries in Atlantic Canada.

The FRCC does not support the operation of the pilot recreational fishery for 3Pn4RS at the present time and recommends that no recreational fishery take place in 3Pn4RS in 2003/2004.

Spawning Closures As described in the Council's Conservation Framework, the FRCC strongly supports protecting spawning fish. Moreover, as part of the Gulf-wide (Northern and Southern Gulf areas) closure proposed (see Introduction Section), the Council supports the specific spawning closure for the previously identified area off Bay St. George-Port au Port. While the following recommendation is contained within the proposed Gulf-wide closure to directed cod fishing from April 1 to June 23, we reiterate the recommendation here with specific relevance to protecting the 3Pn4RS cod spawning stock in this area.

In addition to the Gulf-wide closure to directed cod fishing from April 1 to June 23 each year, the FRCC recommends that specifically for 3Pn4RS, no *groundfish* fishing should take place in the area off Bay St. George-Port au Port (as designed elsewhere) from April 1-June 23, 2003.

Fishing Gear The proposal that the directed cod fishery in the Northern Gulf be transformed in 2003/2004 to a 100% longline and handline fishery only is viewed by the FRCC as a positive conservation measure. The FRCC therefore supports the view of the industry in making this proposal and is encouraged by the support of fishermen and processors alike within 3Pn4RS that this dramatic shift can be successfully and immediately implemented in 2003/2004. In expressing this support, the Council anticipates that fewer fish will be killed and fish quality yields will bring improved value to the industry because of the elimination of waste experienced inevitably in the gillnet fishery. The FRCC further recognizes that this recommendation is not a panacea, that incidental fishing from all gear occurs, and that the move to this measure will cause some fishermen in 3Pn4RS to experience increased hardships. However, the Council is convinced that the opportunity now to implement this sweeping measure successfully and to conserve fish in the immediate term as a result, may have significant benefits for valuation, markets, as well as for more effective management in this fishery.

The FRCC recommends that the directed fixed gear cod fishery in 3Pn4RS be restricted immediately to longline and handline gear only. Furthermore, the FRCC recommends that in areas where and times when the fixed gear directed cod fishery is open, all fixed gear groundfish activity (lumpfish excepted) in those areas and times where cod are normally found, be restricted to longline and handline gear only.

Catch Limits In its previous report on this stock, the FRCC concluded that if stock abundance in this current year showed significant decline, then the total removals for the fishery must be significantly reduced. Moreover, the Minister instructed the Council to justify any type of ongoing harvesting on these stocks, in evaluating the the prospects for an immediate, substantial and durable improvement in stock condition.

The Council's view is that the current status of this stock is not improving and is not likely to improve significantly in the short run without significant action (e.g., reduction in seal predation on cod) that is independent of fishing levels as experienced in recent years. While realizing that the catch of even one cod in a fishery will reduce overall stock abundance, the Council, while acknowledging the relative magnitude of natural mortality attributed to seals, does not attribute the limited catch of recent years in the fishery to a reason for the lack of recovery of the stock. The complete replacement of catches in recent years back into the population, assuming current elevated levels of natural mortality, would not move the stock into a position of recovery and positive growth. The stock's position vis-à-vis the conservation limit reference point for Northern Gulf cod estimated at between 100,000t and 200,000t does not change – the Council acknowledges that the stock is well below these limit reference levels. As such, the Council can never be satisfied until the stock is exhibiting appreciable growth toward the conservation limit thresholds – whether the spawning stock biomass is actually at a level of 40,000t or 80,000t does not, in the Council's view, constitute a "better" position.

In light of the extensive discussions that have been taken place in political fora and in the media with respect to the Minister's options, we present the following discussion on the suite of possible options confronting the Minister.

The Council considers that the Minister's options for harvesting this stock include the following:

1. Status Quo Option – total removals be maintained at 7,000t for 2003/2004, as part of the immediate implementation of the proposed 100% longline and handline directed cod fishery only.
2. Intermediate Option – total removals be reduced significantly and the conservation elements of the proposed plan (100% longline and handline directed cod fishery only) be adopted.
3. Closure Option - Close the directed commercial fishery on cod.

The FRCC is of the opinion that a "Status Quo" 7,000t fishery is not a conservation strategy; several years fishing at this level has led to no improvement in stock status. Moreover, in light of the FRCC's recommendation one year ago, and the Minister's directive this year, this TAC level can no longer be substantiated. Given the current low recruitment estimates, and even with the conservation measures of the proposed restrictive gear plan, there is an expectation that the stock will decline.

As for the case of Southern Gulf cod, the Council considers that a complete closure of all commercial groundfish fishing in 3Pn4RS is an unrealistic option that would in no way guarantee stock rebuilding. Closure would substantiate the view – in the perception of the fishing communities - that the fishery and fishing communities are of little consequence. The difficulty the Council has with such a draconian approach is that, taken on its own, it also fails to conserve the stock, let alone stimulate rebuilding. Moreover, there is a view that a closed fishery would actually increase unreported mortality to a level on par with an index fishery that is unregulated. The declaration by science for this stock that biomass will not improve appreciably or continue to decline even with no fishing is interpreted by the Council as an overwhelming need to take auxiliary action independent of fishing, e.g., as mentioned previously, reduce cod predation by seals as a first coordinated step to stock rebuilding.

Some critics would say that the Council's conservation mandate dictates that it must, under the circumstances of stock status, recommend a complete fishery closure for 3Pn4RS cod. The view of the Council is that this is just too easy to impose and it amounts to simply "walking away" from the resource, and the Council is fearful that doing so will not prevent continued undetected harm to the resource. In response to those critics, the Council notes that science states clearly that a complete cessation of a fishery will not stimulate stock growth and rebuilding. As such, by recommending closure, the Council would not be responding to the urgent request of the Minister to do exactly that - stimulate stock growth and rebuilding.

In rejecting the extreme positions of status quo and closure on catch limits for the reasons cited above, the Council finds itself in a "fall back" position. It is an important part of the Council's mandate to include the fishing industry and their feedback in the construction of advice to the Minister. Moreover, the Minister and his Department have worked very diligently to foster partnerships and collaborative arrangements with industry and fishing communities throughout Atlantic Canada. In response, industry has enhanced their role as resource stewards and have contributed directly to conservationist practices by engaging in research activities, and supporting the collection of data for scientific assessments through sentinel fisheries activities. The Council is of the view that it is in the best interests of the Department, and the Minister's ability to implement change to continue to engage the fishing industry in all actions needed toward stock evaluation, conservation, and rebuilding.

This argument provides rationale for operating a significantly reduced index-style fishery in 3Pn4RS directed at cod and prosecuted by active Northern Gulf fixed gear fishermen who will act as the Minister's sounding board on what is actually happening in the ecosystem. Without the information source provided by fishermen on the water, then the Council fears – as evidenced from the experience of the precipitous decline in the 4VsW cod stock along the eastern Scotian Shelf despite a moratorium since 1993 – that the alternative is: (i) a loss of first hand information about the stock, (ii) a deterioration of the relationship between DFO and fishermen, and (iii) an excuse for inaction on important fishery independent strategies (e.g., predation of cod by seals) under the guise of no fishery on the stock most affected. As fishermen often tell the FRCC, closing the fishery will merely save the remaining cod for the seals.

The following recommendation for a significantly reduced (-50%) limit on total removals is understood to require careful management considerations for the timing and participation of the fishery in the 3Pn4RS zone. The Council anticipates that this level of catch, while below the levels recommended by industry, would nevertheless not undercut the successful implementation of the fixed gear transformation to a 100% longline and handline only fishery.

The FRCC recommends that Total Removals, including by-catch provisions from all other fisheries and planned sentinel program and survey removals, of 3Pn4RS cod be set at a level not to exceed 3,500t for each of the next five years subject to annual review.

Sources

DFO Science

SSR (2003/017) Northern Gulf of St. Lawrence Cod (3Pn, 4Rs) in 2002.

FRCC Consultations

The FRCC held consultations on this stock in 2003 in:

Port Hawkesbury, NS (March 3)
Moncton, NB (March 3)
Magdalen Islands, QC (March 4)
Gaspé, QC (March 5)
Blanc Sablon, QC (March 6)
Cow Head, NL (March 7)
Port aux Basques, NL (March 8)

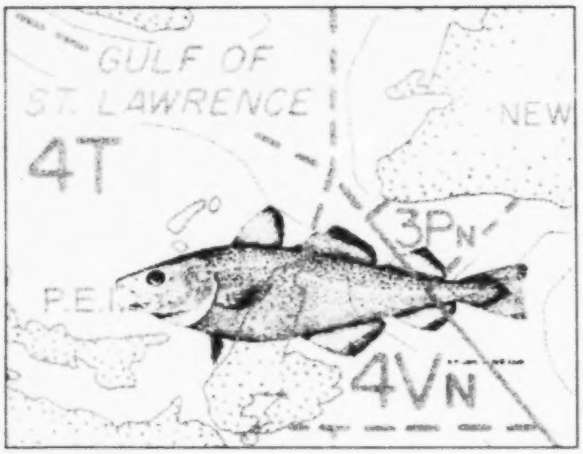
Written Briefs

Fisheries Association of Newfoundland and Labrador Ltd. – Alastair O'Rielly (2003-010-00056)
Fisheries Association of Newfoundland and Labrador Ltd. – Alastair O'Rielly (2002-010-00219)
Labrador Fishermen's Union Shrimp Company Ltd. – Gilbert W. Linstead (2003-010-00039)
Labrador Straits Development Corporation – Kelvin Letto (2003-010-00062)
Fish Harvester's Resource Centre – Harlan Warren (2003-010-00065)
Pêcheurs Polivalents Old Fort Blanc Sablon – Jean-Richard Joncas (2003-010-00066)
Hélène Chevrier (2003-010-00067)
Roger Keough (2003-010-00068)
Fish, Food and Allied Workers – Dave Decker (2003-010-00070)
3Pn4Rs Cod Groundfish Licence Holders' Petition - Roger Keough (2003-010-00068)
Charles W. Genge (2003-010-00074)

Council's View of Stock Status

Overall indicator:	overall stock status remains low at levels similar or slightly declining since 1999
	Compared to average
Overall biomass:	decline between 2000 and 2002; slightly declining since 1999
Recruitment:	1993 yc still maintaining the fishery; no major signs of recruitment recovery
Growth and condition:	biological characteristics have improved
Age Structure:	increased proportion of older fish; population of juveniles declining due to series of poor recruitment
Distribution:	spreadout in the fishing area; fish stayed later throughout the Gulf in 2002; mixing confounds distribution in the overwintering area
Recent exploitation rate:	current exploitation is likely to be high

COD - 4TVN



PERSPECTIVE

Cod in the southern Gulf of St. Lawrence have been exploited for over three centuries. After averaging 30,000t early in the last century, landings rose to peak at more than 100,000t in 1958. Landings remained in the 60,000t range after the mid-1960's. TACs were first imposed in 1974 and these became restrictive as the stock declined in the early 1970's. The stock recovered during the 1980s and catches returned to the 60,000t level after which the fishery declined rapidly in the early 1990's. In September 1993, a moratorium to commercial fishing was announced. The fishery was reopened for limited commercial fishing in 1999.

Landings prior to 1950 were primarily hook and line, with mobile gears and gillnets being introduced after a ban on otter trawling was lifted. After 1950, this fishery has supported a substantial harvesting and processing industry in communities in the southern Gulf and the Cabot Strait area where the stock overwinters.

Southern Gulf cod are migratory. The stock overwinters outside the Gulf in 4Vn and northern 4Vs along the edge of the Laurentian Channel. Fish migrate into the shallower waters of the Gulf after the breakup of winter ice. Spawning occurs throughout the Gulf from April through July. During the summer cod are distributed widely. The fall migration begins in October and cod become more concentrated off western Cape Breton in November as they move into 4Vn to overwinter. In some recent years the migration out of the Gulf appears to be taking place earlier than usual with peak fishing off Cape Breton in October.

While this stock has supported a substantial harvesting and processing industry in the past, it is considered to be a stock with low productivity compared to cod stocks outside of the Gulf of St. Lawrence. Accordingly, it should be managed cautiously as high growth rates cannot be expected.

ANALYSIS

I. SCIENCE STOCK ASSESSMENT

The 2003 Stock Status Report (SSR) for 4TVn cod reports that abundance and SSB estimates are low and declining. As for the northern Gulf cod stock, natural mortality on this stock remains higher than normal. Sources of unaccounted "natural" mortality include predation by seals, poor environmental conditions, unreported catches, and changes in life history. Scientists estimate that the annual consumption of cod by grey seals (17,000t to 29,000t) and harp seals (2,000t to 10,000t) combined on this stock range from 19,000t to 39,000t – a range of values that exceeds the 6,000t fishing limit by over 3 to 6 times and it more than doubles the earlier combined estimates of 7,000t to 15,000t suggested in the 1999 SSR. Commercial fishery catches are therefore small by comparison and within the uncertainties of these estimates.

Other highlights from the 2003 SSR include:

- Production – stock assessment estimates report a reduction of SSB over the previous year as predicted; based on estimates of recruitment at age 3 cod, all year-classes in the 1990s are below average; the 1998-2000 year classes are estimated to be the lowest on record since the early 1970s.
- Environment –weights at age were slightly lower than in 2001; the geographic range for the stock has contracted to the smallest area in the 32-year time series; cod are less available in the western region of the southern Gulf and are more available to the east.
- Fishing mortality – estimates since 1999 are about the same at approximately 0.10.
- Natural mortality – remains high for adult cod (0.40) and is attributed to seal predation as the major factor in this elevated mortality.

The scientific prognosis for the stock estimates that with no fishing in 2003/2004, the spawning stock biomass would be expected to decline. Rebuilding of the spawning stock biomass over the next few years is

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000/01	2001/02	2002/03*
TAC	67	60	45.2	54	54	53	48	43		No directed fishery				3	6	6	6	6
Catch	64	68.7	54.6	47.9	42.7	40.2	31.5	28.3	4.01	0.9	0.3	0.4	1.5	2.5	6.2	5.6	5.7	4.7

*Catch as of January 3/2003

1. Above figures include Reported Landings extracted from the Integrated Fisheries Management Plan Atlantic Groundfish (IFMP). Statistics may not coincide with reported removals from SSR.

unlikely even with no fishery. The SSB estimated for 2003 is below the conservation limit reference points leading to high likelihood that the productivity of this stock has suffered serious harm.

II. Industry Views

The FRCC conducted public consultations on this stock in Port Hawkesbury, Nova Scotia, Moncton, New Brunswick, the Magdelan Islands, and Gaspé, Québec. In light of the recent reports in the media surrounding DFO's position on the future of the Atlantic cod fisheries, the tone of these meetings throughout the Southern Gulf was tense but constructive with good attendance and meeting participation. Participants came prepared to discuss a number of recurring issues summarized as follows:

1) Critical Analysis of the Stock Assessment. As in past years, industry participants at the FRCC consultations, and in written briefs, expressed frustration over what they considered was the low reliability of the *CCGS Alfred Needler* survey. Their view was that there was probable cause for differences in the research vessel survey data compared to the actual population based on fishermen's observations on the water including good rates and evidence of "lots of fish". Reasons cited for this possible discrepancy included changes in fish distribution and timing of migration not being incorporated in the *Needler* survey, locations of research vessel tows, and perceived discounting of some sets. As well, industry was eager to implement the otter trawl component of the proposed sentinel program to compare to the *Needler* results using commercial fishing vessels similar to the surveys conducted in the northern Gulf.

2) Predation by Seals. The Council acknowledges the frustration expressed by the fishing industry with respect to the large predation by seals on the Gulf cod stocks. Seal consumption estimates of cod are many times larger than the catches of the commercial fishery. Fishermen feel that large-scale predation by seals is competing with minimal catches by commercial fishermen and they do not comprehend how the industry can be held responsible for this high natural mortality or how potential catches by fishermen can be displaced by allowing seals to continue killing cod.

The problem of seals in the southern Gulf is clearly due to the presence of a large, all-year round resident population of grey seals. Fishermen appear to be more resigned this year than ever to the negative impact of seals on stock rebuilding without recourse to being able to do anything about it. Fishermen acknowledged the positive first steps of the increase recently announced in the harvest of harp seals. At the same time, they concede that the proposed seal harvest increase is small relative to the population, that the increase harvest of young seals will not have any immediate effect on the ongoing cod predation by adult seals, and most importantly that there is no similar action in the reduction of the grey seal herds for which there is no commercial harvest. Fishermen cited numerous cases of seals staying year-round in areas they would normally leave by the spring. They also, again this year, identified areas of large grey seal aggregations (and the presence of "hundreds of seals" around sites in the Magdelan Islands archipeligo), reported on observations of "belly-feeding" on adult cod and flatfish, and about fish carcasses on ice.

3) Sentinel Fishery Activities. In spite of the impending changes and downsizing of the sentinel program, fishermen were generally supportive of the continuation and participation of the sentinel program as a means of continuing longitudinal stock database information as well as maintaining industry contact with the resource.

4) Unaccounted Mortality from the Recreational Fishery. Again this year, industry participants at consultations supported the recommendation for a halt to the recreational fishery program. Fishermen rejected the recreational fishery estimates (295t in 2002) as being accurate. They continue to consider catches in the recreational fishery to be an uncontrollable and an unknowable source of mortality on the cod stock.

III. FRCC Recommendations

The FRCC is mandated to construct its recommendations to the Minister by considering, as summarized above, (i) the scientific evidence from the Stock Status Report, and (ii) the views of the industry provided in the consultation meetings and through briefs presented to the Council. These recommendations are provided to

the Minister toward the ultimate goal of rebuilding the stock to "optimum levels". **In this year of continued crisis and urgency related to constructive action and positive response in this stock, the FRCC has taken a critical view toward proposing a suite of practical conservation measures for immediate implementation by the Minister and his Department.**

The Council urges the Minister to consider these recommendations to be an integrated set of interdependent conservation measures. The Council therefore encourages the Minister and his staff to consider the acceptance of all of these measures as a whole and to engage in their immediate and coordinated implementation in full partnership with industry as the Council's best feasible advice to give the stock all opportunities to grow and rebuild.

Seals Given the Minister's request to the FRCC to evaluate the prospects for an immediate, substantial and durable improvement in stock condition, the Council is unanimous in declaring its *only* credible response to this request is to seek from the Minister – once again – immediate, substantial and durable action to reduce natural mortality on all cod stocks by reducing the predation by seals. The only means of achieving this is to reduce the size of the seal herds in the management area.

The Council cannot overstate to the Minister the problem of grey seal predation on cod as the single most important reason for lack of recovery of the southern Gulf cod stock. The Council's view continues to be that seal predation is many times more a critical factor than the current low level of fishing mortality in preventing the rebuilding of these cod stocks. More importantly, again this year, science indicates that even without any cod fishing whatsoever, the stock of cod in the southern Gulf is expected to decline. The urgency that this statement suggests underscores the need for immediate action to reduce the grey seal herd in 4T. The Council is of the opinion that with immediate action, the grey seal herd size is manageable to the benefit of both groundfish stock growth and, the continued sustainability of a healthy seal herd.

As a first step, the FRCC proposes therefore that the Minister act immediately to establish specific seal exclusion zones for Southern Gulf cod within the 4T management area. Fishermen and scientific surveys have reported that there are aggregations of juvenile and adult fish including stocks of cod as well as flatfishes around the Magdalen Islands and in the area north and east of the islands toward the Laurentian Channel. In recognition of this area as an area where aggregations of grey seals are also present, the FRCC sees the immediate opportunity of limiting natural mortality on vulnerable cod stock aggregations through the designation of this area as a pilot seal exclusion zone. This approach is consistent with the 3-year Seal Management Plan recently announced. The FRCC underlines the need for an orderly operation of exclusion zones through the training of professional seal exclusion zone monitors. All monitors, in partnership with DFO marine mammal scientists will require a training period and will be tasked with regular reporting on the incidence and activities of seals in the exclusion zone, with moving seals off the area, with taking samples designated for scientific study, and learn more about the dynamics of seals in general.

The FRCC recommends the establishment of a year-round seal exclusion zones for around Corps Mort, Ile Brion, and Rochers aux Oiseaux in the Magdalen Islands archipeligo. The FRCC further recommends that local community groups present proposals for training and acting as seal exclusion zone monitors to carry out the responsibilities associated with the assigned tasks. Finally, the FRCC recommends that the proposals be directed to assigned DFO Marine Mammal specialists responsible for coordinating the operations, responsibilities, and management of the seal exclusion zones program.

Spawning Closures As described in the Council's Conservation Framework, the FRCC strongly supports protecting spawning fish. Moreover, as part of the Gulf wide (northern and southern Gulf areas) spring spawning closure proposed (see Introduction Section), the Council supports the specific spawning closure for the previously identified area around Miscou Bank and the Shediac Valley in 4T west. While the following recommendation is contained within the proposed Gulf-wide closure to directed cod fishing from April 1 to June 23, we reiterate the recommendation here with specific relevance to protecting the 4TVn cod spawning event that takes place in this area.

In addition to the Gulf-wide closure to directed cod fishing from April 1 to June 23 each year, the FRCC recommends that specifically for 4TVn, no *groundfish* fishing should take place in the designated area around Miscou Bank and the Shediac Valley from April 1-June 23, 2003.

Sentinel Fishery The FRCC also reiterates its support for the objectives of the sentinel program for this stock and supports all efforts of this program to increase information gathering and stock research opportunities. The FRCC also supports the DFO-Industry Collaborative Partnership program designed to engage the

industry in working on alternative projects related to regional-based sentinel activities. Finally, the Council anticipates the revision of the 4T sentinel program and the implementation of the mobile gear survey in 2003.

The FRCC recommends that DFO Science in collaboration with industry implement in 2003 the mobile gear component to the sentinel program to cover all areas of the southern Gulf following an appropriate statistical design.

Recreational Fishery Based on the principles defined in the Council's Conservation Framework, the FRCC supports only those fisheries that are controllable to the greatest extent possible and return the maximum information to science and management. Following on the information provided for recreational catches in 4TVn in 2002/2003 compared to past estimates, the FRCC does not believe that information on the recreational fisheries in the southern Gulf is of equivalent quality compared to that from the sentinel and commercial fisheries collected by professional fishermen who operate under a management regime of strict controls and monitoring. The following recommendation therefore reiterates the Council's stand on recreational fisheries in Atlantic Canada.

The FRCC does not support the operation of a recreational fishery on 4TVn cod at the present time and recommends that no recreational fishery take place in 4TVn in 2003/2004.

Catch Limits In its previous report on this stock, the FRCC concluded that if stock abundance in this current year showed significant decline, then the total removals for the fishery must be significantly reduced. Moreover, the Minister instructed the Council to justify any type of ongoing harvesting on these stocks in evaluating the prospects for an immediate, substantial and durable improvement in stock condition.

In concurrence with the science prognosis for this stock, the Council's view is that "the spawning stock biomass is expected to decline even with no fishery", so that "rebuilding of the spawning stock biomass over the next few years is unlikely even with no fishery". This creates a serious dilemma for the Council. Assuming a complete cessation of fishing on cod were feasible, the Minister's request to the Council to grow and rebuild the stock is not achievable with this approach over the foreseeable future. Thus, the Council – as it did last year – reasserts to the Minister that without significant auxiliary actions that must include a reduction in grey seal predation on cod, the Minister's request to the Council will not be attainable.

The Council notes that auxiliary action is required independent of any fishing activity. Thus, as for the case of Northern Gulf cod, while realizing that the catch of even one cod in a fishery will reduce overall stock abundance, the Council, while acknowledging the relative magnitude of natural mortality attributed to seals, does not attribute the limited catch of recent years in the fishery to a reason for the lack of recovery of the stock. The complete replacement of catches in recent years back into the population, assuming current elevated levels of natural mortality, would not move the stock into a position of recovery and positive growth. The evidence from the most recent stock assessment is that the spawning stock biomass has not been able to move out of the tight range of between 64,000t and 90,000t since the beginning of 1992 – just before, during, and after the 1993-1997 moratorium period. Thus, the Council acknowledges that the stock's position vis-à-vis the conservation limit reference point for Southern Gulf cod estimated at 80,000t has not changed over that entire period. As such, the Council can never be satisfied – as per the Minister's request - until the stock exhibits appreciable growth beyond the conservation limit threshold.

In light of the extensive discussions that have taken place in political fora and in the media with respect to the Minister's options, we present the following discussion on the suite of possible options confronting the Minister.

The Council considers that the Minister's options for harvesting this stock include the following:

1. Status Quo Option – the total removals be maintained at 6,000t for 2003/2004.
2. Intermediate Option – the total removals be significantly reduced.
3. Closure Option - Close the directed cod commercial fishery in 4TVn.

The FRCC is of the opinion that a continued "Status Quo" 6,000t fishery is not a conservation strategy; several years fishing at this level has led to no improvement in stock status. Moreover, in light of the FRCC's recommendation one year ago, and the Minister's directive this year, this TAC level can no longer be substantiated.

The Council considers that a complete closure of the directed cod fishery in 4TVn is an unrealistic option that would not provide the least bit of assurance that the stock may rebuild. The difficulty the Council has with such a draconian approach is that, taken on its own, this strategy also fails to conserve the stock, let alone stimulate rebuilding. Moreover, given the amount of activity on the water from other directed fishing

activity, there is a view that a closed fishery would actually increase unreported mortality to a level on par with an index fishery that is unregulated. The declaration by science for this stock that biomass will continue to decline even with no fishing is interpreted by the Council as an overwhelming need to take auxiliary action independent of fishing, e.g., as mentioned previously, reduce cod predation by grey seals as a first, coordinated step toward stock growth and rebuilding.

Some critics would say that the Council's conservation mandate dictates that it must, under the circumstances of stock status, recommend a complete fishery closure for 4TVn cod. The view of the Council is that this is just too easy and it amounts to simply "walking away" from the resource, and the Council is fearful that doing so will not prevent continued undetected harm to the resource. In response to those critics, the Council notes that science states clearly that a complete cessation of a fishery will not stimulate stock growth and rebuilding. As such, by recommending closure, the Council would not be responding to the urgent request of the Minister to do exactly that - stimulate stock growth and rebuilding.

In rejecting the extreme positions of status quo and closure on catch limits for the reasons cited above, the Council finds itself in a "fall back" position. It is an important part of the Council's mandate to include the fishing industry and their feedback in the construction of advice to the Minister. Moreover, the Minister and his Department have worked very diligently to foster partnerships and collaborative arrangements with industry and fishing communities throughout Atlantic Canada. In response, industry has enhanced their role as resource stewards and have contributed directly to conservationist practices by engaging in research activities, and supporting the collection of data for scientific assessments through sentinel fisheries activities. The Council is of the view that it is in the best interests of the Department, and the Minister's ability to implement serious change to engage the fishing industry in all actions needed toward stock evaluation, conservation, and stock rebuilding.

This argument provides rationale for operating a significantly reduced index-style fishery in 4T directed at cod and prosecuted by active Southern Gulf fishermen who will act as the Minister's sounding board on what is actually happening in the ecosystem. Without the information source provided by fishermen on the water, then the Council fears – as evidenced from the experience of the precipitous decline in the 4VsW cod stock along the eastern Scotian Shelf despite a moratorium since 1993 – that the alternative is: (i) a loss of first hand information about the stock, (ii) a deterioration of the relationship between DFO and fishermen, and (iii) an excuse for inaction on important fishery independent strategies (e.g., predation of cod by seals) under the guise of no fishery on the stock most affected. As fishermen often tell the FRCC, closing the fishery will merely save the remaining cod for the seals.

The following recommendation for a significantly reduced (-50%) limit on total removals is understood to require careful management considerations for the timing and participation of the fishery in the management area.

The FRCC recommends that total removals, including by-catch provisions from all other fisheries and planned sentinel program and survey removals, of 4TVn cod be set at a level not to exceed 3,000t for each of the next five years, subject to annual review.

Capacity reduction In 1997, the FRCC published *"A Groundfish Conservation Framework for Atlantic Canada"*. This document provided the Council's own interpretation of its conservation mandate and described how it's conservation strategy could be operationalized.

A tenet of the Conservation Framework was the realization that "the fishery of the future should be a smaller, more conservation-oriented fishery." To achieve this goal, the report noted that measures to establish conservationist harvest rates would require controlling fishing effort and managing fishing capacity. Further, the report stated that

> "...if fishery management is not effective in limiting effort, it may be unable to keep the capacity off the water and conservation problems could result. It is for this reason that reducing fishing capacity can be seen as a conservation issue; the need for reductions in capacity has been noted repeatedly in FRCC documents to date." (p.32)

Finally, the framework document recommended to the Minister that the fishing industry be encouraged to:

> "Take immediate actions, in cooperation with Management, to facilitate the reduction of harvesting capacity." (p.49)

With the focus of capacity reduction as a conservation measure in mind, the FRCC is very concerned that the reduced directed cod fishery in 4T is today neither smaller nor more conservation-oriented than it was in the pre-moratorium period. In particular, the operation

of the fixed gear timed openings in 4T that are characterized by "54-hour fisheries", a multitude of vessels, and a peak period of catches and landings are not considered by the FRCC to be conservationist. In the case of these "derby fisheries", the FRCC believes that conservation problems arise as a consequence of the inordinate amount of capacity on the water directed at relatively small quantities of cod during these short, intensive fishing periods.

The FRCC recommends that DFO and industry focus their efforts to address the issue of "Derby Fisheries" and that a proper balance be found between capacity and the recommended level of removals.

Sources

DFO Science

SSR (2003/016) Cod in the southern Gulf of St. Lawrence.

FRCC Consultations

The FRCC held consultations on this stock in 2003 in:

Port Hawkesbury, NS (March 3)
Moncton, NB (March 3)
Magdalen Islands, QC (March 4)
Gaspé, QC (March 5)
Blanc Sablon, QC (March 6)
Cow Head, NL (March 7)
Port aux Basques, NL (March 8)

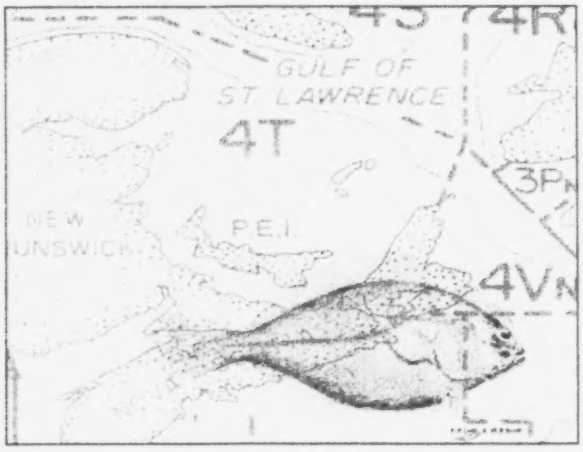
Written Briefs

North of Smokey Fishermen's Association – Osborne Burke (2003-010-00057)
PEI Charter Boat Operators - Norman Peters (2003-010-00058)
Association Québecoise de l'Industrie de la Pêche (2003-010-00060)
NCBFVA – Clifford Aucoin (2003-010-00041)
Association des pêcheurs des îles-de-la-Madeleine – Léonard Poirier (2003-010-00061)
Maritime Fishermen's Union – Local 6 – Jeff Brownstein (2003-010-00045)
PEI Groundfish Association – Frank Hennessey (2003-010-00063)
Morutiers Traditionnels de la Gaspésie – Martin Donahue (2003-010-00059)
Fédération des pêcheurs semi-hauturiers du Québec – Gabrielle Landry (2003-010-00042)
Morutiers Traditionnels de la Gaspésie – Martin Donahue (2003-010-00059)

Council's View of Stock Status

Overall indicator:	stable for the last few years during a period of poor growth and high natural mortality; no significant change; stock status may worsen over 2003
	Compared to average
Biomass:	stable since 1998; likely to experience a decline in 2003 even without a fishery
Recruitment:	at low levels since late 1980s; 1999 poorest ever
Growth and condition:	stable
Age Structure:	increased proportion of older fish; population of juveniles declining due to series of poor recruitment
Distribution:	geographic range for the stock has contracted to the smallest area in the 32 year time series
Recent exploitation rate:	stable at approximately 8% since 1999

AMERICAN PLAICE - 4T



PERSPECTIVE

In the southern Gulf of St. Lawrence (NAFO subdivision 4T), American plaice was once the most abundant groundfish after cod. Females of the species are distinguished by a faster growth and reach larger sizes than males. Female American plaice reach sexual maturity between 7 and 15 years of age while males reach maturity between 5 and 7 years of age. Spawning occurs in late Spring and early Summer. Results based on research surveys indicate that the stock is at its lowest historical level. The survey trawlable biomass, which was estimated at 300,000t in the late 1970's, decreased to approximately 30,000t in 1999. Age-classes between 4 and 7 years are stable at a low level. Recent Research Vessel (RV) survey catches were more abundant in the eastern part of 4T. Recent commercial catches show a pattern of a shift in distribution of the stock in recent years consistent with the survey.

The 4T American plaice fishery has been managed by quota since 1977, with landings ranging between 5,000t and 10,000t until 1992. From 1993 to 1999, lower catches in the range of 1,300t to 2,400t did not allow for a recovery of the stock, according to the scientific assessment.

ANALYSIS

The 2003 DFO Stock Status Report indicates that

- In 2002, landings of American plaice declined to 637t, the lowest level since 1965. This is due in part to a reduction in the quota, from 2,000 to 1,000t and to reductions in effort and market conditions since 2000.
- The RV survey abundance index indicates that the stock in 4T has been at its lowest level for the past three years. The declining trend in the index since 1975 is primarily caused by a decline in western 4T.
- Recruitment remains low and well below the long term average.
- Without improved recruitment and at recent catch levels, no improvement can be anticipated in the short to medium term.

The < 45' mobile gear competitive fleet sector directing for this stock had caught 90% of their allocation, although other fleet sectors did not. Industry stakeholders argued that poor market conditions have not permitted them to catch the total TAC, therefore, due to lack of effort, landings declined to 637t in 2002.

Generally, fishermen agreed with the Stock Status Report that this stock is at low levels. During consultations, industry requested to maintain quota levels. As stated in the SSR, some fishermen also believed that seal predation on plaice may be substantial.

The FRCC believes that this stock is currently at a relatively low level, mainly due to a decline that occurred in 4T west. The FRCC is concerned with the low abundance and if this stock continues to show decline, a further reduction will be necessary.

The FRCC recommends that the TAC for 4T American plaice be maintained at 1,000t for 2003/2004.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000/01	2001/02	2002/03*
TAC	10	10	10	10	10	10	10	10	5	5	5	2	2.5	1.5	2	2	2	1
Catch	10.5	7.7	8.4	6.8	4.8	4.4	5.04	4.9	1.6	2.4	2.3	1.4	1.7	1.1	1.5	1.4	0.9	0.6

*Catch as of January 3/2003

1. Above figures include Reported Landings extracted from the Integrated Fisheries Management Plan Atlantic Groundfish (IFMP)

Sources

DFO Science

SSR 2003/004 American Plaice in the Southern Gulf of St. Lawrence (Div. 4T).

FRCC Consultations

The FRCC held consultations on this stock in 2003 in:

Port Hawkesbury, NS (March 3)
Moncton, NB (March 3)
Magdalen Islands, QC (March 4)
Gaspé, QC (March 5)
Blanc Sablon, QC (March 6)
Cow Head, NL (March 7)
Port aux Basques, NL (March 8)

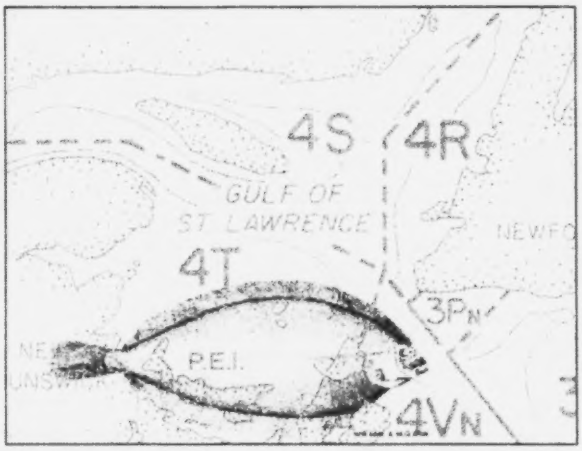
Written Briefs

NCBFVA – Clifford Aucoin (2003-010-00041)

Council's View of Stock Status

Overall indicator:	low
	Compared to average
Overall biomass:	RV survey indicates lowest level in the last three years since 1975
Growth and condition:	unknown
Recruitment	low but stable
Age Structure:	unknown
Distribution:	concentrated in the eastern part of 4T
Recent exploitation rate:	unknown

WITCH FLOUNDER - 4RST



PERSPECTIVE

Witch flounder are found in the deeper waters of the North Atlantic. In the Northwest Atlantic, witch range from the lower Labrador coast to cape Hatteras, North Carolina. They are slow growing and long-lived. Spawning for this species occurs from Spring to late Summer, depending on the region. Spawners aggregate in Channels in January and February, in the Gulf of St. Lawrence.

Witch flounder are known to move into deep water during Winter months and they cease feeding during that period. Witch grow faster in the Gulf of Maine and Georges Bank, where feeding occurs year-around and water temperature is higher, in comparison with northern areas of their range.

With the introduction of the otter trawler, the commercial fishery for witch flounder was developed significantly in Newfoundland in the 1940's. The fishery in the Gulf of St. Lawrence began when the stocks in Fortune Bay declined and the vessels moved into Bay St. George (Newfoundland) in the 1950's.

Winter catches of witch gained in importance in the offshore, as by-catch in the cod and redfish directed fisheries. The fishery further expanded in the Gulf during the 1970's to the Esquiman Channel and the northern shore of Cape Breton Island.

Witch flounder in the northern Gulf of St. Lawrence (4RS) came under quota management in 1977, with a precautionary quota of 3,500t. The first detailed assessment of 4RS was conducted in 1978 and continued until 1981. During the 1980's, landings in 4T increasingly dominated Gulf witch landings, however the management unit remained as 4RS. The TAC was increased to 5,000t in 1979 in 4RS, to remove an old and slow growing component of the stock. This measure reduced the age composition of the stock and landings declined, and by 1982 the TAC was reduced to 3,500t. Stock assessments resumed in 1991, and following the recommendations of the Fisheries Resource Conservation Council in 1994, the management unit was extended to 4RST in 1995.

ANALYSIS

The 2003 DFO Stock Status Report indicates that:

- In 2002, the TAC remained at 1,000t. Total landings were 943t. Seine fleets directing for witch flounder caught their quota in both 4R and 4T.
- The research vessel survey biomass index for commercial sizes (30+cm) increased from low values in 1999 and 2000 but declined back to a lower value in 2001 and 2002.
- In contrast to other areas of the Gulf, the biomass index for eastern 4T has been at a high level since the mid-1990's.
- No clear biomass trends are evident from sentinel surveys of the northern Gulf (primarily 4R and 4S), though the 2002 catch rates are the lowest in the 8-yr time series for both the July and October surveys.
- A strong year-class, likely 1995, was observed in the research vessel survey of the northern Gulf from 1997 to 2001, and if it persists, the resource in 4RST should improve. However, this year-class did not appear to be strong in the 2002 survey.
- Stock structure is a major source of uncertainty for this resource.

According to the view of the industry, they felt that an increase in the TAC was warranted based on increases in catch rates in recent years along with DFO Science's outlook that this stock should continue to improve due to the strong 1995 year-class. They generally felt that the TAC had been set at low levels according to the stock biomass.

The FRCC notes that the higher proportion of the overall biomass is found in the Cape Breton Trough area of eastern 4T. The Council recognizes that the strong 1995 year-class should soon contribute to the

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000/01	2001/02	2002/03*
TAC	3.5	3.5	–	3.5	3.5	3.5	3.5	3.5	3.5	1	1	1	1	0.8	0.8	1	1	1
Catch	0.7	0.8	0.3	0.16	1.20	0.7	0.5	0.4	0.5	0.1	0.3	0.5	0.6	0.89	0.82	0.87	0.85	0.94

*Catch as of January 3/2003

1. Above figures include Reported Landings extracted from the Integrated Fisheries Management Plan Atlantic Groundfish (IFMP)

fishery. However, at this time, it would be premature to increase the TAC based only on this particular year-class that is still mostly pre-recruits. Also, much of the biomass is currently immature at below 30 cm.

The FRCC recommends that the TAC for 4RST witch flounder be maintained at 1,000t for 2003/ 2004.

Considering the high level of uncertainty on the structure of this stock, the Council believes that it is important to continue the research on this particular issue. A number of exceptionally strong year-classes have been produced on the Scotian Shelf in the 1990's, perhaps contributing to the increase in abundance of larger witch flounder in the Cape Breton Trough.

The FRCC recommends that DFO Science continue the investigation on the witch flounder stock structure and report at the next Regional Advisory Process (RAP).

Sources

DFO Science

SSR 2003/005 Witch flounder (Divs. 4RST).

FRCC Consultations

The FRCC held consultations on this stock in 2003 in:

Port Hawkesbury, NS (March 3)
Moncton, NB (March 3)
Magdalen Islands, QC (March 4)
Gaspé, QC (March 5)
Blanc Sablon, QC (March 6)
Cow Head, NL (March 7)
Port aux Basques, NL (March 8)

Written Briefs

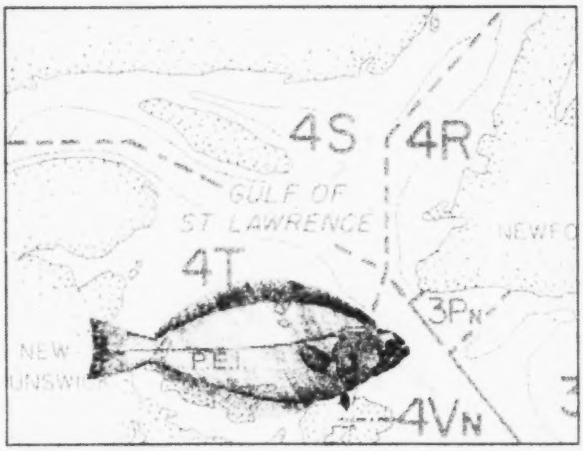
Roger Keough (2003-010-00068)

NCBFVA – Clifford Aucoin (2003-010-00041)

Council's View of Stock Status

Overall indicator:	population still at low level, slightly improving in size
	Compared to average
Overall biomass:	slight improvement in the mid-term, increase in eastern 4T
Growth and condition:	unknown
Recruitment:	strong year-class observed (1995)
Age Structure:	unknown
Distribution:	decrease in all sectors, except Eastern 4T
Recent exploitation rate:	low landings related to low TAC

GREENLAND HALIBUT - 4RST



PERSPECTIVE

Greenland halibut are generally found at depths of 70 to 280 fathoms. Spawning takes place primarily in Winter, from January to March. Male and female halibut have different growth rates, with females reaching maturity at a larger size. There are two main fishing areas for this stock in the Gulf of St. Lawrence: a western area, in the St. Lawrence estuary and the Anticosti Island area, which represents generally more than 80% of the catches, and an eastern area, in the Esquiman Channel.

ANALYSIS

The development of the fishery is recent. Until the mid-1970s, Greenland halibut landings in 4RST were primarily of by-catches from other groundfish fisheries. Later, a directed fishery using gillnets and bottom trawls was developed and led to record landings, very high catches, above 8000t, were experienced and were followed by a sharp decline. In 2002-2003, this fishery is mainly prosecuted with gillnets with a 3,500t TAC, from which, only 1,600t were caught. Conservation measures implemented, by regulation and by industry initiatives (i.e. mesh size, reduction of fishing effort, sorting grids in the shrimp fishery) have led to a recovery of the stock from 2,000t TAC in 1996.

In the 2003 stock status report, it is stipulated that the biomass indices increased between 1995 and 2000, but were down in 2001 and 2002. However, the 2002 DFO survey was still higher than the 1990s index average. The higher index is due to the production of good year-classes (1989, 1990, 1991 and 1995). The DFO survey index was also boosted by the large year-classes of 1997 and 1999.

The individual growth rate of the large 1997 year-class was lower than that of the previous year-classes in the western Gulf. The lower growth rate had less of an effect in the Esquiman Channel, which explains why fishing was better there in 2002. However, in 2002, the diet condition and growth rate of juvenile Greenland halibut improved and size at sexual maturity also increased in males. Although the abundance of pre-recruits is high (97 and 99 year-classes), it is difficult to predict how successful the fishery will be in 2003, considering the slow growth rate of the 97 year-class.

The FRCC recommends a TAC of 3,500t for 4RST Greenland halibut for 2003/2004.

During the 2003 consultations, the industry expressed the wish to use the 5.5 inch mesh as they feel the males may not reach the size to be ever captured in 6 inch mesh. They feel that the 6 inch mesh targets the larger females, which in their opinion could have a negative impact on the stock's long-term reproductive capacity. In order to address this issue, they propose the use of either 5.5 or 6 inch mesh for the coming season. The industry also showed concern about low rate of return of tags.

In 2002, a comparative fishing experiment was conducted in Quebec using 5.5 inch and 6 inch mesh. It showed that the proportion of females in the catch was high (greater than 80%) with either mesh size. Mean catch sizes in landings with 5.5 inch and 6 inch mesh were 43 cm and 45 cm respectively. The proportion of immature females was at 62% with 5.5 inch mesh, whereas, it was at 42% with 6 inch mesh. In addition, the catch per unit of effort (CPUE) was at least three times higher with the 5.5 inch mesh versus the 6 inch mesh.

In light of the results from the comparative study on mesh size in 2002, the FRCC recommends the exclusive use of 6 inch mesh in the Greenland halibut fishery for 2003/2004.

The FRCC also reiterates its recommendations for the results of the ongoing otolith trace element studies to be pursued and presented at a future Regional Advisory Process (RAP).

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000/01	2001/02	2002/03*
TAC	5	5	8.7	10.5	10.5	10.5	10.5	10.5	4	4	4	2	3	4	4.5	4.5	4.5	3.5
Catch	2.3	6.5	10.9	7.5	5	2.3	2	3.5	2.5	3.5	2.4	1.9	2.6	3.9	3.6	2.2	1.3	1.7

*Catch as of January 3/2003

1. Above figures include Reported Landings extracted from the Integrated Fisheries Management Plan Atlantic Groundfish (IFMP)

Sources

DFO Science

SSR 2003/007 Gulf of St. Lawrence (4RST) Greenland Halibut in 2002.

FRCC Consultations

The FRCC held consultations on this stock in 2003 in:

Port Hawkesbury, NS (March 3)
Moncton, NB (March 3)
Magdalen Islands, QC (March 4)
Gaspé, QC (March 5)
Blanc Sablon, QC (March 6)
Cow Head, NL (March 7)
Port aux Basques, NL (March 8)

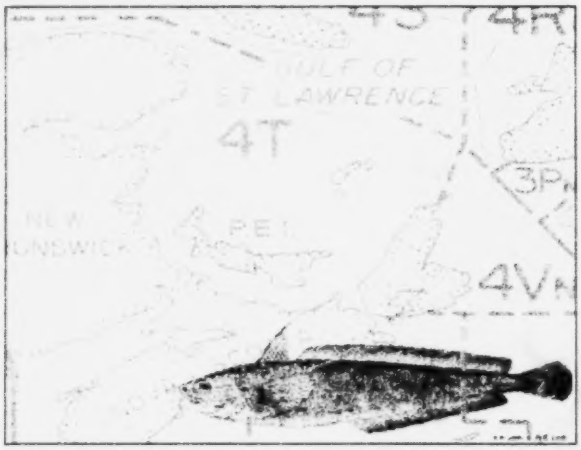
Written Briefs

Regroupement des Pêcheurs Professionnels du Nord de la Gaspésie - André Boucher (2003-010-00073)

Council's View of Stock Status

Overall indicator:	slight decline from 2001
	Compared to average
Overall biomass:	decrease from 2001 to 2002
Growth and condition:	slow growth, but slight recovery in 2002
Age Structure:	reduction of larger fish
Distribution:	expansion South of Anticosti Island
Recent exploitation rate:	low as TAC not taken in the last four years

WHITE HAKE - 4T



PERSPECTIVE

White hake are distributed from southern Labrador and the Grand Bank to North Carolina to the South. The white hake fishery has been conducted in the southern Gulf of St. Lawrence since the early 1960's. Traditionally, this stock has been harvested with both mobile and fixed gear primarily in the inshore fishery. Although this fishery did not rate as the most important groundfish fishery, it nevertheless played a vital role in the historical landings and revenues of the inshore fleet. The largest proportion catches have been taken in the southern Gulf of St-Lawrence, concentrated in the Northumberland Strait, on the western end of P.E.I. and between P.E.I. and Cape Breton Island.

Annual landings in this southern Gulf groundfish fishery have averaged 5675t from 1960 to 1994. Catch rates continued to decline in the early 1990's. A substantial drop in landings took place in 1993, until the fishery closed in 1995. Since the moratorium, the landings have ranged from 399t in 1999 to 60t in 2002. There is increasing evidence of two different stock components: one occupying Northumberland Strait in shallow water and another along the Laurentian Channel in deeper water. Limited removals have continued since the moratorium for the purposes of sentinel surveys and by-catch for other fisheries. There is a Fall migration of adults into 4Vn for the Winter.

ANALYSIS

In 2002, the indices of abundance and biomass from the annual Research Vessel (RV) survey have declined to their lowest levels in the history of this survey. It reached levels lower than those observed when the directed fishery was closed. The distribution of white hake remains concentrated in a small part of the ranged that it occupied before the early 1990s. Stock structure is a major source of uncertainty for this resource.

The abundance of commercial-sized fish (greater than or equal to 45 cm) remains very low and the abundance of incoming size-classes (less than or equal to 25 cm) is at the lowest level seen since the late 1980s. Few or no age-0 fish (less than 10 cm) have been caught since the 1996 survey. Although there is much uncertainty about the seals' diet in the southern Gulf, some analyses suggest that predation by seals on white hake may be considerable.

The FRCC continues to recommend that there be no directed fishery for 4T white hake in 2003/2004.

The FRCC also recommends that conservation measures previously implemented for this stock, especially the close monitoring of by-catch, be continued and enforced.

According to the industry, tagging efforts, which are considered necessary to help determine stock structure and migration should be pursued in shallow water as well as parasite analysis. A study with tagging may help to differentiate stock structure and migration patterns.

The FRCC recommends that tagging studies continue to be carried out on white hake to determine stock structure and migration dynamics in and out of the Gulf.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000/01	2001/02	2002/03*
TAC	12	12	9.4	5.5	5.5	5.5	5.5	5.5	3.6	2				No directed fishery				
Catch	6.7	4.9	5.9	3.7	4.9	4.2	3.7	3.9	1.2	0.9	0.06	0.04	0.1	0.13	0.16	0.12	0.05	0.06

*Catch as of January 3/2003

1. Above figures include Reported Landings extracted from the Integrated Fisheries Management Plan Atlantic Groundfish (IFMP)

Sources

DFO Science

SSR 2003/001 White Hake in the Southern Gulf of St. Lawrence (Div. 4T).

FRCC Consultations

The FRCC held consultations on this stock in 2003 in:

Port Hawkesbury, NS (March 3)
Moncton, NB (March 3)
Magdalen Islands, QC (March 4)
Gaspé, QC (March 5)
Blanc Sablon, QC (March 6)
Cow Head, NL (March 7)
Port aux Basques, NL (March 8)

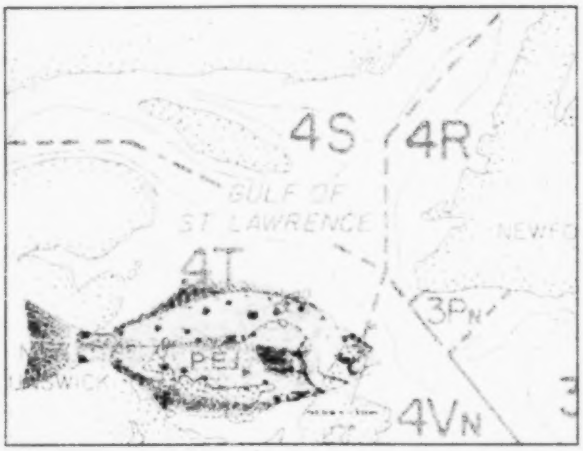
Written Briefs

No briefs received

Council's View of Stock Status

Overall indicator:	stock abundance is very low
	Compared to average
Overall biomass:	lower than the long term average
Growth and condition:	no information
Recruitment	very low, little information
Age Structure:	uncertain, little information
Distribution:	continues to be concentrated in eastern 4T, western Cape Breton, St. George's Bay
Recent exploitation rate:	very low

ATLANTIC HALIBUT - 4RST



PERSPECTIVE

Atlantic halibut is widely distributed in the deep channels of the Gulf of St. Lawrence. It is thought that it over winters outside the Gulf, possibly in the 3Pn area. Information related to the life cycle, biology and reproduction of halibut is limited. The species grows rapidly and continuously at about 8 centimeters per year in the Gulf. Females reach a larger size than males. Spawning is thought to occur from January to May.

The halibut fishery is generally prosecuted with longlines. Over the past 20 years, the average landings are in the range of 300-400t with peaks as high as 800t in the 1960's. Historical data from prior to 1950 indicate that catches may have been above 1,000t.

ANALYSIS

The stock was not fully assessed in 2002 but updated from fishery landings data and the tagging program which is in its fifth year. The Stock Status Report update indicated:

- The stock remains at a very low level and that landings remain below the TAC (due to certain allocations not being fished).
- The absence of restrictions for the Atlantic halibut in subdivision 3Pn could affect the conservation of the Gulf stock.
- The majority of halibut harvested by the commercial fishery has ranged from 81 to 110 centimeters. This may indicate that the fishery is dependent on the annual recruitment of halibut of minimum size.
- Increased number of small Atlantic halibut in the catch could be due to better survival following the introduction of the Nordmore grid and the reduction in trawling activities since the moratoria.
- Lack of recent data on sexual maturity for the Gulf halibut stock does not allow biologists to confirm whether the minimum legal size of 81 cm is adequate to protect the spawning stock.
- An increase in the abundance of small halibut has been noted in the scientific surveys coinciding with industry observations.

A tagging program on small under 81 cm halibut that must be released was initiated 5 years ago. Tagging results show there is no significant relationship between tagging and recapture and the distance between tagging and recapture sites. Also, no relationship was noted between the size of fish at tagging.

As in previous years, most of the 2002 catch was taken with fixed gear, primarily longlines. Reported landings were 264t against a TAC of 350t due to certain fleets not fishing their allocations.

The implementation of a minimum legal size and the mandatory release of undersized halibut has translated into a significant decrease in the reported landings of small fish. However, questions remain about the actual size at maturity for females, which might be higher than the present minimum legal size of 81 cm. This raises the issue of stock reproductive capacity under the current management regime. However, the wide size range of fish caught in the fishery is a positive sign of stock health.

The FRCC recommends that the release of fish smaller than 81 cm continue to be enforced and all mortality associated with discarding be included in total mortality estimates.

The FRCC remains concerned by the catches occurring in Winter in the Cabot Strait (3Pn area) which are not attributed to an adjacent stock area. Tagging recaptures should resolve this issue over time.

The FRCC recommends that 3Pn catches continue to be limited to 40t until the stock structure is defined from tagging data.

Limited industry input reported that there has been good indications of halibut abundance and recommended an increase in TAC. This is consistent with, and possibly related to, the large increase in abundance

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000/01	2001/02	2002/03*
TAC	–	–	–	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.35	0.35	0.35	0.35
Catch	0.19	0.27	0.27	0.19	0.22	0.42	0.34	0.14	0.11	0.12	0.07	0.23	0.28	0.3	0.34	0.28	0.28	0.27

*Catch as of January 3/2003

1. Above figures include Reported Landings extracted from the Integrated Fisheries Management Plan Atlantic Groundfish (IFMP)

also reported in areas 4VWX and 5. These reports also agree with the stock trends described by DFO Science. One industry brief recommends a 100t increase for this stock. However the uncertainties related to stock structure, age at maturity information, and number of small halibut in the catch warrant a cautious approach.

The FRCC recommends that the TAC for 4RST Atlantic halibut be maintained at 350t for 2003/2004.

Due to the difficulty in measuring this stock accurately using traditional scientific surveys and lack of information on this stock, it appears future assessments would greatly benefit from a dedicated longline survey to measure halibut abundance and stock characteristics.

The FRCC recommends that the establishment of a longline survey be explored and considered for the Gulf region by DFO with the participation of industry, possibly modeled after the ongoing Halibut Longline Survey being conducted in the Scotia Fundy region for the past five years.

Sources

DFO Science

SSR 2003/006 Atlantic Halibut of the Gulf of St. Lawrence (4RST) Update (2002)

FRCC Consultations

The FRCC held consultations on this stock in 2003 in:

Port Hawkesbury, NS (March 3)
Moncton, NB (March 3)
Magdalen Islands, QC (March 4)
Gaspé, QC (March 5)
Blanc Sablon, QC (March 6)
Cow Head, NL (March 7)
Port aux Basques, NL (March 8)

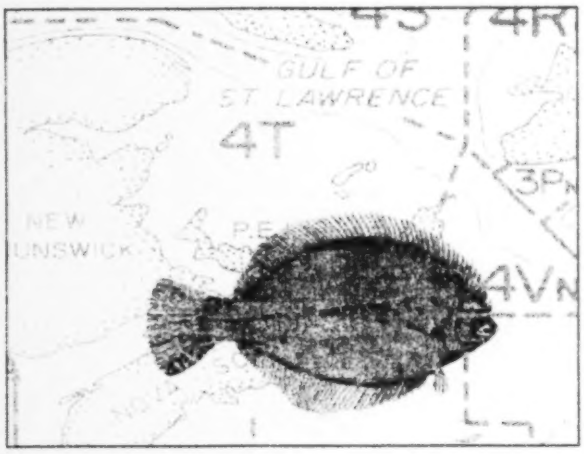
Written Briefs

No briefs received

Council's View of Stock Status

Overall indicator:	stock at low level showing increase in juveniles
	Compared to average
Overall biomass:	unknown but likely to be at low level, probably increasing.
Growth and condition:	not available
Age Structure:	no reliable indicator, wide size range present in the fishery
Distribution:	not changed in recent years
Recent exploitation rate:	stock has maintained some degree of stability at current harvesting rate, the TAC of 350t was not caught for the past three years

WINTER FLOUNDER - 4T



PERSPECTIVE

In the southern Gulf of St. Lawrence (4T), Winter flounder are limited to the Magdalen Islands and to southern parts of 4T: Chaleur Bay, Shediac Valley, Northumberland Strait, and St. George's Bay. Growth rates vary widely between regions, with females reaching sexual maturity at about 25 cm and with males maturing at about 20 cm.

The historical landings in the 4T Winter flounder fishery varied widely between a few tons and 4,500t. Those large fluctuations may be partially due to misreporting or to landings of "unspecified" flatfishes. Lower landings could have also been affected by the use of larger mesh sizes, which have increased considerably since 1960. The catches were limited by a precautionary TAC of 1,000t since 1996. Landings declined after 1997, on the order of 600t annually. The landings were 400t in 2002.

Winter flounder are shallow water species, found primarily in depths less than 40 meters. They migrate seasonally from the coast and overwinter in estuaries. Otter trawls are the dominant gear type landing up to 75% of the catches in 2000 and 2001. The fixed gear fishery has evolved into a 'tangle net' fishery using modified nets set on the Spring and Fall spawning beds of herring to capture Winter flounder.

ANALYSIS

Following the full assessment carried out on this stock in 2000, DFO Science provided an update in 2003. The Stock Status Report for 4T Winter flounder confirms trends observed in the past years. The annual research survey in 2002 indicates that the stock has been at or near average abundance for the past three years. Research Vessel catch rates have improved since 2000, particularly in the Magdalen Islands area. The biomass index has varied widely over this period, and abundance continue to be below the average for the series. The average size and weight of Winter flounder in the survey has declined since 1971, but appears to have leveled off in recent years. This species is distributed in shallow water at the inshore edge of the groundfish surveys.

In the annual telephone surveys in 2000 and 2001, the dominant view of the fishers was that the resource was at the same level of abundance as in the previous year. Since 1995, fishers have tended to view the abundance trend of this resource favourably.

Comments were made during the 2003 consultations. Industry suggested the maintenance of the 1,000t TAC. They demanded action on the predation by seals on Winter flounder. They requested the continuation of the tagging program.

The FRCC recommends that the TAC for 4T Winter flounder be maintained at 1,000t for 2003/2004.

Considering this stock appears to be made up of several components, the data used to evaluate local abundance, recruitment and stock identification should be improved.

The FRCC recommends that a report be tabled on preliminary management implications of tagging work at the next Regional Advisory Process (RAP).

The FRCC recommends that the DFO planned increase of mesh size to 145 mm square be implemented in 2003.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000/01	2001/02	2002/03*
TAC												1	1	1	1	1	1	1
Catch	1.2	2	1.8	1.4	2.1	2.1	2.5	1.9	1.2	0	0	0	1.08	0.64	0.61	0.57	0.52	0.41

*Catch as of January 3/2003

1. Above figures include Reported Landings extracted from the Integrated Fisheries Management Plan Atlantic Groundfish (IFMP)

Sources

DFO Science

SSR 2003/003 Winter Flounder in the Southern Gulf of St. Lawrence (Div. 4T).

FRCC Consultations

The FRCC held consultations on this stock in 2003 in:

Port Hawkesbury, NS (March 3)
Moncton, NB (March 3)
Magdalen Islands, QC (March 4)
Gaspé, QC (March 5)
Blanc Sablon, QC (March 6)
Cow Head, NL (March 7)
Port Aux Basques, NL (March 8)

Written Briefs

North of Smokey Fishermen's Association – Osborne Burke (2003-010-00057)

PEI Groundfish Association – Frank Hennessey (2003-010-00063)

Council's View of Stock Status

Overall indicator:	stock abundance lower than long term average
	Compared to average
Overall biomass:	unknown
Growth and condition:	size and weight at lower levels than historic average
Age Structure:	unknown
Distribution:	several local stocks, limited knowledge on stocks
Recent exploitation rate:	fishing mortality below average

YELLOWTAIL FLOUNDER - 4T

PERSPECTIVE

Yellowtail flounder in the Gulf of St. Lawrence are primarily concentrated around the Magdalen Islands where they have supported a bait fishery for the local lobster fishery. Other than the localized fishery around the Magdalen Islands, yellowtail flounder is harvested as a by-catch in other fisheries. The Magdalen Island fishery is mainly carried out using mobile gear.

A one-time overseas market developed during 1997 resulted in over 800t being harvested. Quotas were established for this stock in 1998 for the first time at a level of 300t. Due to poor markets, and the establishment of a quota, harvesting effort has been dramatically reduced since 1998. A localized bait fishery continues to be prosecuted.

Yellowtail is predominantly fished from May to October, with largest landings in May and June. Most of the landings came from 4Tf, 4Tg and 4Tl with the largest amount coming from 4Tf (the area around the Magdalen Islands).

Throughout their range, they migrate seasonally into shallower waters in the Spring and back to deeper waters in the Winter. Spawning occurs on or near the bottom in Spring or early Summer.

ANALYSIS

The 2003 DFO Stock Status Report .licates that:

- Catch rates for commercial and sentinel vessels show little change since 1997.
- In 2002, 200t of the 300t TAC was caught.
- The mean numbers per tow for all of 4T in the DFO Research Vessel (RV) survey was approximately 25 yellowtail/tow in the early 80's and has since decreased to 19.
- Following the 800t catch of yellowtail in 1997, the modal (most common) length in the research vessel survey decreased to a very small length (21cm), but has increased since then and remained at 24cm since 2000. There continues to be a large proportion of small yellowtail; in the 2002 RV survey the length-frequency was bimodal at 20cm and 24cm. The proportion of small yellowtail (>25cm) in the RV survey catches in 2002 was 70%.
- Relative fishing mortalities at length has decreased since 1997.
- The stock appears to be able to support harvest levels closer to 300t.

No comments were received on this stock during the 2003 Council consultations.

The number of fish less than 25 cm is uncertain. In addition, the commercial-size fish decreased compared to the 1984-1999 average. Magdalen Islands abundance has been fairly stable since the early 1990's.

The FRCC recommends that the quota of 300t be maintained for 4T yellowtail flounder in the Magdalen Islands area in 2003/2004.

The joint Industry-Science research program carried out in the past seems very promising and should be encouraged.

The FRCC recommends that the DFO-Industry project continue to develop indices of abundance and recruitment in order to get more complete information for future assessment of this stock.

The FRCC recommends that in other areas, catches should not exceed those required for the normal conduct of fisheries directed toward other species.

The FRCC recommends that DFO management increase observers at sea in order to more effectively monitor the by-catch of cod.

Figures are in 000t

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000/01	2001/02	2002/03*
TAC											0.43	0.43	0.8	0.3	0.3	0.3	0.3	0.3
Catch					0	0	0	0.12	0.12	0.06	0.2	0.21	0.8	0.19	0.34	0.31	0.27	0.19

*Catch as of January 3/2003

1. Above figures include Reported Landings extracted from the Integrated Fisheries Management Plan Atlantic Groundfish (IFMP)

Council's View of Stock Status

Overall indicator:	4T general – abundance is stable.
	Compared to Average
Overall biomass:	similar to overall abundance.
Growth and condition:	the RV survey indicates that the proportion of small fish increased from 50%, before 1997, to 70% in 2002.
Age Structure:	modal age is 4 years old in the 2001 Magdalen Islands inshore survey. Males in this survey are 1 to 7 years old. Females are 2 to 8 years old.
Distribution:	found in southern Gulf and commercial landings are mainly from around the Magdalen Islands.
Recent exploitation rate:	between 1995 and 2001, in the sentinel fishery, catch rates for seiners was negative, however, for the trawlers it was positive. 2001 relative fishing mortality was 0.11 at 26cm.

Sources

DFO Science

SSR 2003/002 Yellowtail Flounder in the Southern Gulf of St. Lawrence.

FRCC Consultations

The FRCC held consultations on this stock in 2003 in:

Port Hawkesbury, NS (March 3)
Moncton, NB (March 3)
Magdalen Islands, QC (March 4)
Gaspe, QC (March 5)
Blanc Sablon, QC (March 6)
Cow Head, NL (March 7)
Port Aux Basque, NL (March 8)

Written Briefs

No briefs received.

APPENDICES

FRCC Terms of Reference

1. Introduction

The Government of Canada is committed to a more comprehensive approach to the conservation and management of our fisheries resource. This approach demands a better understanding of complex fisheries ecosystems - the interaction of fish with other species, predator-prey relationships, and also changes in the marine environment like ocean currents, water temperatures and salinity.

The Government of Canada is also committed to a more effective role in decision-making for those with practical experience and knowledge in the fishery.

The Minister of Fisheries and Oceans has established the Fisheries Resource Conservation Council (FRCC) as a partnership between government, the scientific community and the direct stakeholders in the fishery. Its mission is to contribute to the management of the Atlantic fisheries on a 'sustainable' basis by ensuring that stock assessments are conducted in a multi-disciplined and integrated fashion and that appropriate methodologies and approaches are employed; by reviewing these assessments together with other relevant information and recommending to the Minister total allowable catches (TACs) and other conservation measures, including some idea of the level of risk and uncertainty associated with these recommendations; and by advising on the appropriate priorities for science.

2. Definition of Conservation

Fisheries conservation is that aspect of the management of the fisheries resource which ensures that its use is sustainable and which safeguards its ecological processes and genetic diversity for the maintenance of the resource. Fisheries conservation ensures that the fullest sustainable advantage is derived from the resource and that the resource base is maintained.

3. Council Objectives

3.1 To help the government achieve its conservation, economic and social objectives for the fishery.The conservation objectives include, but are not restricted to:

3.1.1 rebuilding stocks to their 'optimum' levels and thereafter maintaining them at or near these levels, subject to natural fluctuations, and with 'sufficient' spawning biomass to allow a continuing strong production of young fish; and,

3.1.2 managing the pattern of fishing over the sizes and ages present in fish stocks and catching fish of optimal size.

3.2 To develop a more profound understanding of fish-producing ecosystems including the inter-relationships between species and the effects of changes in the marine environment on stocks.

3.3 To review scientific research, resource assessments and conservation proposals, including, where appropriate, through a process of public hearings.

3.4 To ensure that the operational and economic realities of the fishery, in addition to scientific stock assessments, are taken into account in recommending measures to achieve the conservation objectives.

3.5 To better integrate scientific expertise with the knowledge and experience of all sectors of the industry and thus develop a strong working partnership.

3.6 To provide a mechanism for public and industry advice and review of stock assessment information.

3.7 To make public recommendations to the Minister.

4. Mandate and Scope

4.1 The Fisheries Resource Conservation Council will address these objectives by bringing together industry, DFO science and fisheries management, and external scientific and economic expertise in one body.

4.2 The Council will:

4.2.1 advise the Minister on research and assessment priorities;

4.2.2 review DFO data and advise on methodologies;

4.2.3 consider conservation measures that may be required to protect fish stocks;

4.2.4 review stock assessment information and conservation proposals, including through public hearings, where appropriate; and,

4.2.5 make written public recommendations to the Minister on TACs and other conservation measures.

4.3 The Council may recommend any measures considered necessary and appropriate for conservation purposes such as TACs, closure of areas to fishing during specific periods, approaches to avoid catching sub-optimal sized fish or unwanted species, and restrictions on the characteristics or use of fishing gears.

4.4 The Council's scope includes Canadian fish stocks of the Atlantic and Eastern Arctic Oceans. In the first instance, the Council will address groundfish, and then subsequently take on responsibility for pelagic and shellfish species.

4.5 The Council may also advise the Minister on the position to be taken by Canada with respect to straddling and transboundary stocks under the jurisdiction of international bodies such as the Northwest Atlantic Fisheries Organization (NAFO).

5. Size, Structure and Make-Up

5.1 The Council will consist of not more than 14 members with an appropriate balance between 'science' and 'industry'.

5.2 Members are chosen on merit and standing in the community, and not as representatives of organizations, areas or interests.

5.3 'Science' members, are drawn from government departments, universities or international posts, and are of an appropriate mix of disciplines, including fisheries management and economics.

5.4 'Industry' members are knowledgeable of fishing and the fishing industry and understand the operational and economic impacts of conservation decisions.

5.5 All members of the Council are appointed by the Minister.

5.6 All members, including the Chairperson, are appointed for a three year term; terms can be renewed.

5.7 Members appointed from DFO serve 'ex officio'.

5.8 Members have to disclose any interest in the Atlantic or Eastern Arctic fishery and take appropriate measures so as to avoid potential or real conflict of interest situations during the term of appointment.

5.9 The four Atlantic Provinces, Quebec and Nunavut may each nominate one delegate to the Council. These delegates have access to the Council's information, and may participate fully in meetings, but will not be asked to officially endorse the formal recommendations to the Minister.

5.10 The Council is supported by a small Secretariat, to be located in Ottawa. The Secretariat will:

5.10.1 provide administrative support for the functioning of the Council;

5.10.2 provide a technical science and fisheries management support;

5.10.3 organize Council meetings;

5.10.4 record decisions of the Council;

5.10.5 undertake a professional communications function for the Council, providing a central point for communications to and from the Council; and

5.10.6 undertake such other matters as from time to time might be appropriate.

5.11 The Chairman may appoint an Executive Committee, consisting of the Chairman, Vice-Chairman, and three other Members.

5.12 In addition, the Chairman may, from time to time, strike an 'ad hoc' committee to deal with a specific issue.

6. Activities:

6.1 Reviews appropriate DFO science research programs and recommends priorities, objectives and resource requirements.

6.2 Considers scientific information - including biology, and physical and chemical oceanography, taking into account fisheries management, fishing practices, economics and enforcement information.

6.3 Conducts public hearings wherein scientific information is presented and/or proposed conservation measures/options are reviewed and discussed.

6.4 Recommends TACs and other conservation measures.

6.5 Prepares a comprehensive, long-term plan and a work plan for the Council which are reviewed annually at a workshop with international scientists and appropriate industry representatives.

6.6 Ensures an open and effective exchange of information with the fishing industry and contributes to a better public understanding of the conservation and management of Canada's fisheries resource.

FRCC MEMBERSHIP:

Members:

Fred Woodman, Chairman
Jean Guy d'Entremont, Vice-Chair
Maurice Beaudin
Bill Broderick
Bruce Chapman
Guy Cormier
Nick Henneberry
Douglas Johnston
Dan Lane
Jean-Jacques Maguire
Paul Nadeau
John Pope
George Rose
Karl Sullivan

Provincial Delegates:

Carey Bonnell, Nunavut
Mario Gaudet, New Brunswick
David MacEwen, Prince Edward Island
Dario Lemelin, Québec
Tom Dooley, Newfoundland and Labrador
Clary Reardon, Nova Scotia

Ex Officio:

Gilles Belzile
Barry Rashotte
David Gillis

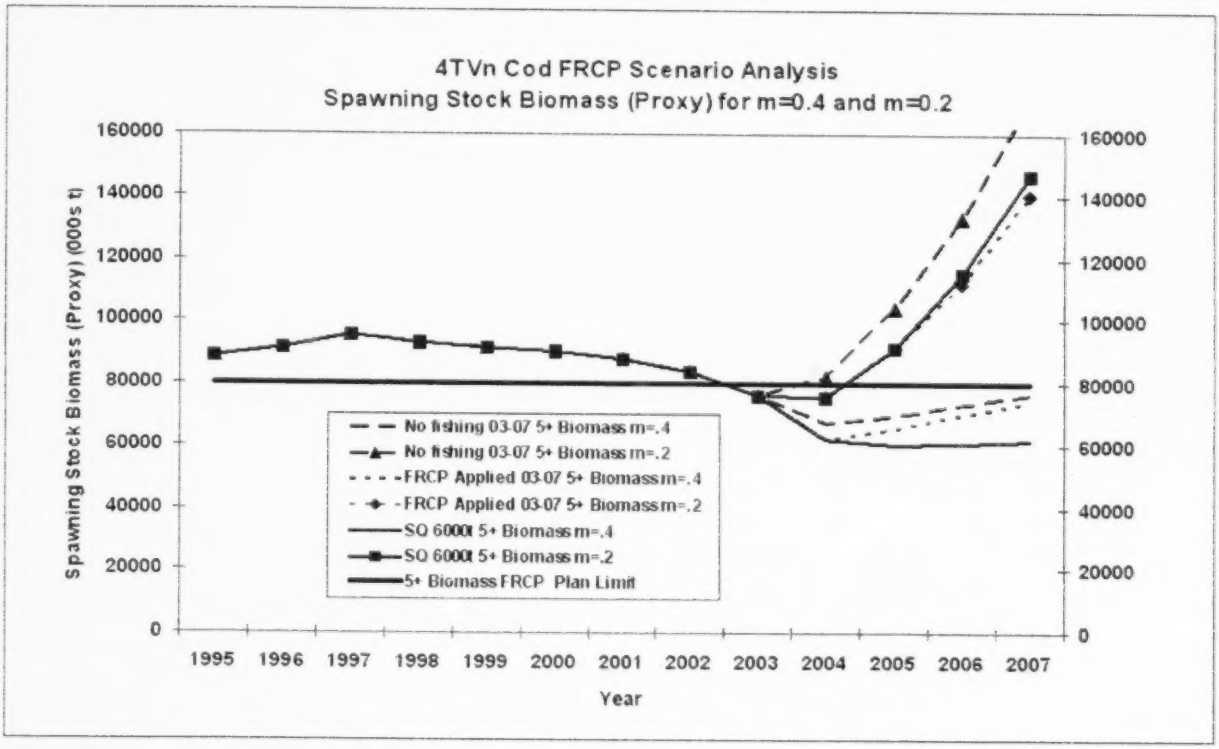
Secretariat:

Arthur Willett, Executive Director
Tracey Sheehan
Helena Da Costa
Debra Côté

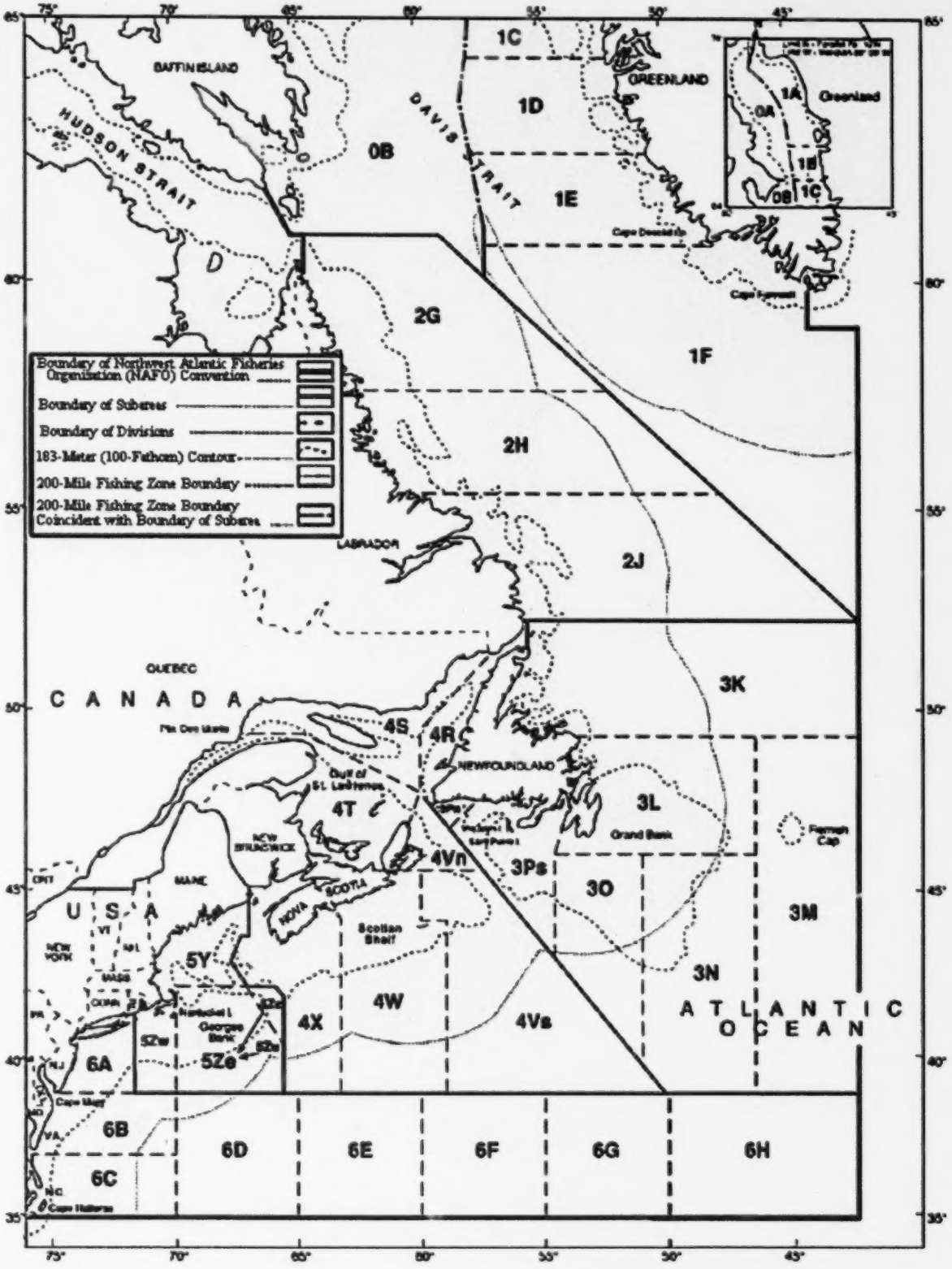
Acronyms

CNOPB	The Canada-Newfoundland Offshore Petroleum Board
CNSOPB	The Canada-Nova Scotia Offshore Petroleum Board
CPUE:	Catch per unit of effort
DFO:	Department of Fisheries and Oceans
FRCC:	Fisheries Resource Conservation Council
GEAC:	Groundfish Enterprise Allocation Council
IFMP:	Integrated Fisheries Management Plan
ITQ:	Individual Transferable Quotas
IVQ:	Individual Vessel Quotas
MPA:	Marine Protected Area
NAFO:	Northwest Atlantic Fisheries Organization
PA:	Precautionary Approach
RAP:	Regional Advisory Process
RV:	Research Vessel
SSB:	Spawning Stock Biomass
SSR:	Stock Status Report
TAC:	Total Allowable Catch
TAGS:	The Atlantic Groundfish Strategy
VPA:	Virtual Population Analysis
ZAP:	Zonal Assessment Process

4TVn Cod FRCP Scenario Analysis



200 Mile Fishing Zone and NAFO Fishing Boundaries



Canada